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A More Hopeful Outlook

Rail Orders from Mexico and Argentina

Pig Iron Sales Increase, But at the Expense of Prices

The steel manufacturers met expectations at their New York conference last week in the unanimity with which they favored holding present prices. Apart from pig iron producers, who saw no early prospect of betterment in their industry, those who attended found reason for taking a more hopeful view of the situation. This feeling has been communicated to sales organizations and has been reinforced by better buying in some lines, with the result that the net balance of the week's developments in finished lines is on the side of improvement.

The position of the steel manufacturers is that prices for their products have already been sufficiently readjusted and should not go lower except as there is a general reduction in commodities and labor. They contend further that cutting prices at this time would not increase business. At the same time there is no new evidence of absolute adhesion to a price or that the slight irregularities that have existed for weeks have disappeared.

The chief item in the rail trade is the closing of three export contracts. Argentine lines have taken 15,000 tons from the Maryland Steel Company and 5600 tons from the Steel Corporation, and the latter has closed 5000 tons for a Mexican line.

New domestic rail orders are light, but there are several good inquiries. The Tennessee Company's mill has started rolling on the Louisville & Nashville order of 30,000 tons already announced, but the report of 42,000 tons additional for the same line is a fiction. The Gary rail mill has also started up, while the South Chicago rail mill has closed down.

Plate mills are counting on a slightly better rolling schedule as the result of recent car orders. The Pennsylvania Lines West placed 1030 cars and the Pennsylvania Railroad Company bought 1000 cars for its eastern lines. The Missouri Pacific orders were for 1000 refrigerator cars and 1000 steel hopper cars.

In structural work the West has made a good showing, though no single contract was for more than 1000 tons. On the 6000 tons for the Bureau of Printing at Washington, a Boston firm was low bidder. The Lehigh Valley is taking bids on five bridges.

The reflection in the market here of strong conditions abroad is a factor that will bear watching. British tin plates have advanced 6 pence a box in two weeks and the placing of further re-export business with American mills is not unlikely. Canadian inquiry for tin plate in this country is also more active.

Pig iron has been bought more freely but, as has happened over and over in the past year, where the volume of sales has grown prices have shrunk.

In eastern Pennsylvania, following recent purchases of 10,000 tons of basic at $14.25, delivered, a 5000-lot was taken by a steel company which also bought 3000 tons of Bessemer and is in the market for 3000 tons of low phosphorus iron. A St. Louis steel foundry bought 5000 tons of basic iron in Ohio and another St. Louis melter bought a smaller amount through Chicago.

Pittsburgh reports considerable pig iron inquiry. A pipe foundry in western Pennsylvania is said to have bought 30,000 tons of gray forge from a nearby furnace. An Eastern pipe company took 10,000 tons, half No. 4 Southern iron, on which the price was $10, Birmingham.

Buffalo furnaces have inquiries for 25,000 tons of foundry iron and have made sales of 10,000 tons, mostly at concessions. An eastern Pennsylvania foundry has closed for 5000 tons, and good-sized lots are under negotiation by a New Jersey and a New England foundry.

The city of Portland, Ore., awarded 6000 tons of water pipe to the leading cast iron pipe interest, which also took 10,000 tons at Chicago, and made total bookings for the week of 20,000 tons.

Late sales of ferromanganese have been made for delivery throughout the year at $38.50, Baltimore, the lowest price in several years for shipment so far forward.

Copper declined steadily last week, sales being made as low as 12.37½c. for electrolytic. Buying was sufficient to bring a recovery to 12.55c. Tin has gone to 41.75c. The advance in the past 12 months has been 10c., representing 25c. on a 100-lb. box of tin plates.

The Steel Manufacturers and Prices

In discussing recently considerations on both sides of the question of reducing or maintaining prices of steel products, three important differences between the conditions in the steel trade to-day and those in early 1909 were mentioned in these columns. These were, in brief: First, that the financial condition of the steel companies is now much stronger than at the opening of 1909, and hence there is not as great anxiety to get business; second, that then the country was bare of steel, after 15 months of stock consumption, and was ready, as it is not now, to stock up again in response to lowered prices; third, that the gap between selling prices of finished material and the cost of raw materials and labor is less now than at the close of 1908.

In the light of the spirit in which the steel manufacturers of the country are now co-operating, as made clear by their expressions at the New York dinner of last week, a fourth important consideration should be added to those above, namely, the confidence the manufacturers have in each other. It is unusual, to be sure, to catalogue what in one view of it is purely a sentiment, among the economic influences affecting commodity prices. But if the feeling of friendliness and of regard for mutual interests, to which Chairman Gary gave expression in addressing his guests, is shared by them in the same measure, it must be given a high appraisal in any estimate of the future of the steel trade. That such a feeling exists among the heads of the 55 companies which had part in the tribute to Chairman Gary in October, 1909, there is strong evidence. Certainly distinct progress has been made in the past three years toward realizing the Gary idea that "actual friendship may be continuously applied to competitive business."

Chairman Gary's remarks, as reported elsewhere, are of peculiar interest for the light they throw on the present situation in iron and steel. It has been common to say that there is a "controlled market" for steel products. The form of control that exists, as the author of the plan describes it, is, to say the least, unique among all co-operative movements of manufacturers. That it is vastly stronger than any agreement ever entered into, reinforced by whatever penalties, scarcely need be said. That it will be a factor, and an important one, in determining the course of the steel trade in 1911 is also evident.

It is easier to ask than to answer the question, how the stronger confidence the steel manufacturers have in each other will ultimately express itself. It does not mean that under no circumstances will present prices be changed, though it evidently points to a postponement, at least, beyond the time roundly indicated in some predictions, of any change from the present level. The manufacturers evidently have not lost sight of the possibility of a readjustment involving a general reduction of wages; but their purpose to resist to the utmost any further reduction in the price of their products, as long as the present level is maintained for raw materials and labor, cannot be mistaken.

The argument that has seemed conclusive to the manufacturers is that a lowering of prices would not bring the much desired revival in demand. There is in this the implied reservation that a time may come when demand would gather force if the buyer were offered unusual inducements. Yet such a juncture, from the manufacturers' standpoint, is a matter of the indefinite future. Meantime the hope underlying the decision to maintain conditions as they are is that at a time not far distant the turn in the tide will show itself so plainly that the whole trade will move on without the necessity of any further readjustment.

New Jersey's Governor on Corporations

Governor Woodrow Wilson's inaugural address, as was expected, scored the State of New Jersey severely for its laxity in indiscriminately issuing charters to corporations. He urges "the imperative obligation of public policy and of public honesty we are under to effect such changes in the law of the State as will henceforth effectually prevent the abuse of the privilege of incorporation which has in recent years brought so much discredit upon our State." No defense can be made to the charge here made, as for some years it appeared to be possible to secure a New Jersey charter for any kind of a corporation, authorizing it to engage in any function whatever. Latterly, however, the officers transacting this part of the business of the State have proceeded with much more circumspection, as other States, with similarly lax incorporation laws, have been sought out by those who were not anxious to have their projects for incorporation too closely inquired into. But while Governor Wilson proposes to make the New Jersey corporation laws more stringent, so as to safeguard the public in raising the standard set for new applicants for corporate privileges, he goes further in his recommendations. He says:

Such scrutiny and regulation ought not to be confined to corporations seeking charters. They ought also to be extended to corporations already operating under the license and authority of the State. For the right to undertake such regulation is susceptible of easy and obvious justification. A modern corporation—that is, a modern joint stock company—is in no proper sense an intimate or private concern. It is not set up on the risk and adventure of a few persons, the persons who originate it, manage it, carry it to failure or success. On the contrary, it is set up at what may be called the common risk. It is a risk and adventure in which the public are invited to share, and the hundreds, perhaps thousands, who subscribe to the stock do in fact share in it, oftentimes without sharing also, in any effectual manner, in the control and development of the business in which their risk is taken. Moreover, these modern enterprises, with their exchequers replenished out of the common store of the savings of the nation, conduct business transactions whose scope and influence are as wide as whole regions of the Union, often as wide as the nation itself. They affect sometimes the lives and fortunes of whole communities, dominate prices, determine land values, make and unmake markets, develop or check the growth of city and of countryside. If law is at liberty to adjust the general conditions of society itself, it is at liberty to control these great instrumentalities which nowadays, in so large part, determine the character of society. Wherever we can find what the common interest is in respect of them, we shall find a solid enough basis for law, for reform.

The principle here laid down is eminently correct. We must have the corporate form for the transaction of modern business, in its great scope, its huge ramifications and its large units of operation. The corporation cannot be abolished, nor can a limit be set to its size, so far as capitalization goes. It is possible that the future may see even larger corporations than any now in existence, required by the still greater commercial and manufacturing developments of more greatly expanded trade. We have become accustomed to corporations, although many are now very large, and, as Governor Wilson says, they "are no longer hobgoblins which have sprung at us out of some mysterious ambush." But they must be so regulated and controlled that the fact will be apparent to the public or the animosity now existing against corporations because of the past vicious practices of some of them may take destructive form. Not only New Jersey, but some other States need to reform their corporation laws.

The Automobile an Economic Good

Progress in the development and use of small internal combustion engines has been remarkable in the past 10 years. So important have small gasoline engines become to the farmer that manufacturers have scarcely been able to keep pace with the demand. Motor boats are finding a large field for commercial use. Small manufacturing plants are supplied with power at a nominal cost by gasoline engines. In thousands of small mining operations, where the cost of transporting coal would be prohibitory, the gasoline engine supplies cheap power. In fact, engines of this class have become an important factor in the production of wealth.

While the pleasure automobile has been generally regarded as a destroyer of capital, possibly the money spent by users of pleasure cars may be merely the price the country has paid for the development of a new agency of production. The gasoline engine 10 or 15 years ago was erratic and uncertain, and one of the great problems in the development of the automobile has been to perfect it so that its owner would not be stranded far from home. The builders of gasoline engines for all other purposes have profited by the millions expended by the automobile manufacturer.

While manufacturers whose materials and products are shipped in carloads are almost universally located on railroad sidings, an enormous amount of traffic remains to be moved by teams in the cities. A recent estimate of this traffic in New York City alone places it at 54,000,000 tons annually. When a complicated machine of any kind is placed in the hands of the public, an enormous amount of capital is necessarily sunk in failures and experimental work. It has been estimated that the development of modern harvesting machines cost upward of $100,000,000 in the failures of companies that built imperfect machines. The builders who survived profited by the mistakes of those who failed, which seems to be necessary in the evolution of any complex machine subjected to hard usage.

A motor truck is subject to more severe strains and abuse than a harvesting machine. It requires an evolution in the materials used in its construction, as well as in the design of its machinery. To manufacture trucks economically requires a large investment in plant, and if the perfecting of a motor truck were carried on by itself, the capital invested would be exposed to an unusual hazard. The pleasure car manufacturers have rendered an economic service to the country by leading the way into this unknown field of enterprise. Their profits have been large and they have been able to carry the cost of experimental work and losses due to imperfect construction. They have overcome at least 90 per cent. of the hazards that would confront an investment in the manufacture of trucks.

Even the steel industry has profited by the demands made upon it by the automobile manufacturer. The severe strains developed in the frame of a car traveling rapidly over rough or uneven roads called for new discoveries and applications of alloy steels. The machine tool manufacturer has found that these alloys are superior to any material used heretofore for certain parts of his machines, and their use will undoubtedly extend into many other fields. A durable motor truck could not have been built with the materials to be had 10 years ago, but the pioneer work of the manufacturer of pleasure cars has mastered practically all the difficulties in materials.

The usefulness of the motor truck may extend far beyond the paved streets of the city. While the statisticians who figure the cost of moving farm products from the field to the railroad may sometimes exaggerate, there is no doubt that farmers will invest in motor trucks when the capital and maintenance cost bring them within their reach. The cost of living has not been increased so much by the advance in wheat and common commodities as in the hundred and one little things that the modern consumer demands. Whatever saves time and cost in bringing these minor products to market and distributing them will be of enormous economic value to the people. It would seem, on the whole, that the automobile has merely distributed among a large number of people a burden of pioneer expenditure that might otherwise have been concentrated in the form of enormous losses to manufacturers who ventured into this new field of mechanical development.

The Iron Age Index

The index to Volume 86 of *The Iron Age*, July 1 to December 31, 1910, has been compiled and printed and will be mailed to subscribers applying for it. A list of those who have received the index heretofore is

kept in this office, and to all such the latest one will be mailed without notice from them. Additional names will be put upon this list on request.

The Ferrosilicon Syndicate

Confirming the statements made in *The Iron Age* some weeks ago concerning an arrangement among European makers of ferrosilicon, the January 6 issue of the *Iron and Coal Trades Review*, London, says: "Following on negotiations which have been in hand for some months past the necessary steps for the formation of an international syndicate of ferrosilicon producers are about to be taken at a meeting, to be held at Mannheim, Germany, during the next few days. It is stated that the syndicate will comprise all the ferrosilicon producers on the Continent, and will be organized for a period of five years. It is also announced that a special contract has been arranged with the Berner Kraftwerk Gesellschaft of Berne, in accordance with which this company will cease to manufacture ferrosilicon, in return for which it will receive an annual indemnity from the syndicate."

Spang, Chalfant & Co., Inc.—The annual meeting of Spang, Chalfant & Co., Inc., operating the Etna Iron & Tube Works, Pittsburgh, Pa., was held in that city January 16. The following officers were re-elected: Henry Chalfant, president; D. B. McClelland, vice-president and treasurer; A. M. Belt, assistant treasurer, and W. C. Heath, secretary. The first three named, together with D. E. Park and C. H. Spang, were re-elected directors. The company had a very prosperous year in 1910, and has plans under way for the concentration of its machine shops. It will build a new machine shop and pattern shop, expected to be finished about March 1, for which all tools have been purchased.

On Monday, January 16, the Ohio Works of the Carnegie Steel Company, at Youngstown, Ohio, resumed operations in full in the open hearth and Bessemer departments with four of the blast furnaces in operation and two idle. The Bessemer plant of the Republic Iron & Steel Company and nearly all the finishing mills at its Brown-Bonnell and Mahoning Valley works, also at Youngstown, started up the same day to practically full operation. The industries in the Youngstown district are working to fuller capacity this week than for some time.

Edgar Allen & Co., Ltd., Imperial Steel Works, Sheffield, England, whose chief American office and warehouse is at 434 West Randolph street, Chicago, announce that agency arrangements have just been completed with the following named firms at whose warehouses large and comprehensive stocks of Allen's high speed and carbon tool steels will be carried: Roehm & Davison, Detroit, Mich.; J. L. Osgood, Erie County Bank Building, Buffalo, N. Y.; John J. Greer & Co., Inc., 207 West Pratt street, Baltimore, Md.

Owing to increasing pressure of business and to the necessity for night work which has existed for some time at the Remington Typewriter Works, Ilion, N. Y., the works are to be given a largely increased capacity by the erection of a new administration building which, when completed, will make all of the factory floor space available for manufacturing, and will clear the way to further additions which are being planned.

The Pittsburgh Emery Wheel Company, Pittsburgh, Pa., held its annual meeting in that city January 12, at which the following officers were elected: President, Chas. G. Smith; vice-president, J. Walter Hetzel; secretary and treasurer, Albert W. Smith. The officers presented a very encouraging report, business having shown a steady growth since the formation of the company.

The St. Louis Foundry Foremen's Association

It was with pardonable pride that on the occasion of the first annual meeting and banquet of the St. Louis Foundry Foremen's Association, which took place on the evening of January 14, at the Missouri Athletic Club, the originators and organizers, few in number as usually is the case, of the association saw over 100 members and guests seat themselves in the banquet hall. It would doubtless better represent the aim of the association to reverse this comment, since the slogan of the body is comradeship. And this spirit is so full and so broad that the presence of interested proprietors of St. Louis foundries is welcome not only at the festive board but also at the regular meetings of the association.

After the *menu* had been discussed, former president, J. P. Pero, superintendent of the Missouri Malleable Iron Company, who acted as toastmaster, introduced the newly elected president, W. E. Whitman, superintendent of the Whitman Agricultural Company, who responded to the toast, "The St. Louis Foundry Foremen's Association." He was followed by Eugene W. Smith, foundry superintendent of the Crane Company, Chicago. Mr. Smith being a past president of the Associated Foundry Foremen, he was selected to respond to the toast, "The Associated Foundry Foremen." In introducing Mr. Smith, Toastmaster Pero availed himself of the opportunity of thanking that gentleman in behalf of the association for having been instrumental in starting the St. Louis Association and for his valuable aid and counsel. The next speaker was Geo. F. Steedman, president of the Curtis & Co. Mfg. Company. Ferd. Messmer, president of the Ferd. Messmer Mfg. Company; Geo. Rogers, president of the Excelsior Foundry Company of Belleville, Ill.; Charles Barker of the S. Obermayer Company, and E. E. Squire, Jr., of E. E. Squire & Co., also made short addresses The evening wound up with a vaudeville entertainment, a complimentary affair tendered the association by the supply men, who are eligible as honorary members.

The association was organized April 30, 1910, and has now on its roll 61 members. Its membership is not confined to St. Louis, but takes in the neighboring manufacturing districts. The officers for the ensuing year are as follows: President, W. E. Whitman; secretary, G. Roy Rook; treasurer, W. S. Gemmer.

The Iron City Spring Company's New Plant.—For some years this company operated a plant at 510 Allegheny avenue, but some time ago secured a site at 2920 Smallman street, Pittsburgh, and has completed a new steel building, 80 x 120 ft., equipped with a 60-hp. Mertes duplex gas engine, and has installed a complete line of machinery for the manufacture of wagon, truck and auto springs. Frank B. Nimick is president; W. D. Taylor, secretary and treasurer, and Mark M. Foster, general manager. The new plant was started last week. In addition to the above named products the company will repair springs. For the present it will handle all sales from the work's offices.

T. Coleman Ward, resident manager of Hickman, Williams & Co., Oliver Building, Pittsburgh, has been appointed receiver of the Enterprise Foundry Company of the same city. The plant, which makes small castings, will be continued in operation under the management of the receiver.

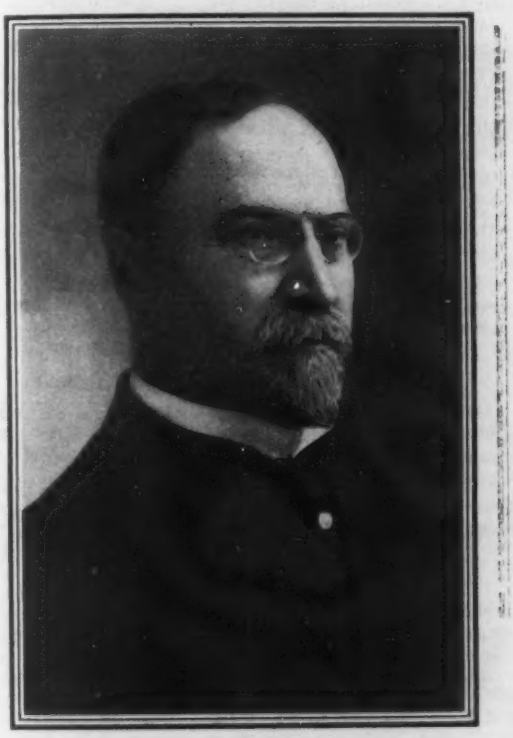
The Stark Rolling Mill Company, Canton, Ohio, reports a good demand for Toncan metal sheets, orders being sufficient to keep its plant running near full capacity. Among orders recently received by this company was one for 5000 tons of Toncan metal for shipment to South Africa.

Reports that a six-day week plan had been put in operation at the blast furnaces of the Youngstown Sheet & Tube Company, Youngstown, Ohio, are incorrect.

Hon. James T. McCleary

Secretary of the American Iron and Steel Institute

At the dinner given in New York, January 11, by Chairman E. H. Gary to the steel manufacturers, announcement was made of the appointment of Hon. James Thompson McCleary as secretary of the American Iron and Steel Institute. Mr. McCleary was introduced to the gathering and made a brief address. His selection as secretary of the institute is in pursuance of the policy outlined at the annual meeting in New York, May 27, 1910, at which it was decided to broaden the work of the organization. In addition to the bringing out from time to time of papers dealing with important developments in iron and steel manufacture, it was planned to have the institute's activities include the relations of



JAMES THOMPSON McCLEARY.

the industry in the United States to producers in other countries; the relations of employers and employees as involved in accident compensation, relief and pension systems and hours and other conditions of labor; the collection of statistical and other information; commercial conditions, contract obligations, &c. On Mr. McCleary's assumption of this important work some account of his career is appropriate.

He was born and educated in Canada. Coming to the United States as a young man he taught school for several years in Wisconsin. In 1881 he resigned the superintendency of the Pierce County, Wis., schools to become professor of history and political science in the State Normal School at Mankato, Minn. After 11 years in this position he was elected to Congress in 1892, and was repeatedly re-elected, serving 14 years continuously.

In March, 1907, on the completion of his service in Congress, Mr. McCleary was appointed by President Roosevelt Assistant Postmaster-General in charge of the transportation of the mails on land and sea, controlling expenditures of about $87,000,000 a year. In September, 1908, he resigned this position to accept his ninth nomination for Congress. Again, as in 1906, he was defeated for election because of his uncompromising stand in favor of protection to all American industries.

Mr. McCleary's committee service in Congress covered a wide range. Among his principal committees were those on Banking and Currency, Labor, Appropriations and Ways and Means. For eight years he was chairman of the Committee on the Library, which has jurisdiction over all bills relating to the Congressional Library, the Botanical Garden and Public Art. Among his predecessors in this position were John Quincy Adams and Rutherford B. Hayes. During his service in this position more was accomplished in providing national memorials in honor of historic men and events than in any similar period. Among these were memorials in Washington to Rochambeau, Pulaski, Von Steuben, Christopher Columbus, John Paul Jones and Commodore John Barry; memorials at the battlefield of King's Mountain, N. C.; Princeton, N. J., and New Orleans, La.; one in Brooklyn, N. Y., in honor of the prison martyrs, and one at Provincetown, Mass., to mark the first landing place of the Pilgrim Fathers.

In 1905 Mr. McCleary was sent to Europe by the Abraham Lincoln Memorial Commission appointed by Congress—of which Wm. H. Taft, then Secretary of War, was Chairman—to get ideas for a national memorial. On his return he recommended as the most suitable memorial to Lincoln a magnificent highway, "the finest in the world," from the White House, in Washington, to the battlefield of Gettysburg, Pa. A bill to carry out this idea was introduced by Senator Knox, now Secretary of State. It passed the Senate, but did not pass the House. Another bill for this purpose is now pending.

On February 12, 1896, Mr. McCleary delivered in the National House of Representatives a speech against free silver, which became the leading document in the Presidential campaign of that year, its circulation reaching many millions. Mr. McKinley regarded this speech as the most potent factor in securing the victory for sound money. In recognition of this, he personally desired in 1897 to appoint Mr. McCleary Secretary of the Treasury. But outside pressure prevailed with him to appoint Mr. Gage.

Mr. McCleary is the father of the most noteworthy feature of the existing tariff law—the minimum and maximum provision, which furnishes our Government what it never had before, a means of compelling other countries to give us fair treatment on tariff matters—he having introduced the first bill presented to Congress for that purpose.

New Publication

Statistics of the American and Foreign Iron Trades. Part II. of the Annual Statistical Report for 1900 of the American Iron and Steel Association. Pamphlet, 6 x 9 in.; pages, 24. Price, $2. Published by the American Iron and Steel Association, 261 South Fourth street, Philadelphia, Pa.

Part II. of the annual report prepared by James M. Swank contains valuable information which could not be included in the report published in July, 1910. It contains the statistics of sheets and tin plates, production of merchant bars and all forms of rolled products of iron and steel, production of cut and wire nails, summary of iron and steel statistics for 1908 and 1900, production of pig iron in the United States for 100 years, production of steel ingots and castings and finished rolled iron and steel in Canada in 1909.

The committee appointed to examine the sale sheets on iron bars for November and December of the Republic Iron & Steel Company and Union Rolling Mill Company found that the average price was 1.35 cents, which fixes the price of puddling for January and February on the basis of $5.87½ per ton. The wages for sheet and tin plate mills for January and February will be on the same basis as for the two preceding months.

The Garry Iron & Steel Company, Niles, Ohio, has begun the construction of a puddling mill in connection with its plant, to comprise six double puddling furnaces and muck bar mill. This will enable the company to manufacture puddled iron sheets.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Jan.18, 1911.	Jan.11, 1911.	Dec.21, 1910.	Jan.19, 1910.
PIG IRON, Per Gross ton:				
Foundry No. 2, standard, Philadelphia	$15.50	$15.50	$15.50	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.25
Foundry No. 2, local, Chicago	15.50	15.50	16.00	19.00
Basic, delivered, eastern Pa.	*14.25*	14.75	14.75	18.75
Basic, Valley furnace	13.25	13.25	13.25	17.00
Bessemer, Pittsburgh	15.90	15.90	15.90	19.90
Gray forge, Pittsburgh	14.15	14.15	13.90	17.40
Lake Superior charcoal, Chicago	18.00	18.00	18.00	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	23.00	23.00	23.00	27.50
Forging billets, Pittsburgh	28.00	28.00	28.00	31.00
Open hearth billets, Philadelphia	25.40	25.40	25.50	30.60
Wire rods, Pittsburgh	28.00	28.00	28.00	33.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.50	14.50	15.50	20.00
Iron rails, Philadelphia	17.00	17.00	17.00	20.50
Car wheels, Chicago	13.00	13.00	13.50	18.50
Car wheels, Philadelphia	13.00	13.00	13.00	17.50
Heavy steel scrap, Pittsburgh	13.50	13.50	13.50	17.50
Heavy steel scrap, Chicago	11.50	11.50	12.00	16.00
Heavy steel scrap, Philadelphia	12.50	12.50	12.50	17.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.32½	1.32½	1.35	1.60
Common iron bars, Chicago	1.30	1.30	1.35	1.60
Common iron bars, Pittsburgh	1.35	1.35	1.40	1.70
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.71
Beams, Pittsburgh	1.40	1.40	1.40	1.55
Angles, tidewater, New York	1.56	1.56	1.56	1.71
Angles, Pittsburgh	1.40	1.40	1.40	1.55
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.25	1.50
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.35	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.85
Cut nails, Pittsburgh	1.60	1.60	1.60	1.85
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.15
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.75	13.00	14.00
Electrolytic copper, New York	12.50	12.50	12.75	13.75
Spelter, New York	5.55	5.55	5.75	6.25
Spelter, St. Louis	5.40	5.40	5.65	6.10
Lead, New York	4.50	4.50	4.50	4.70
Lead, St. Louis	4.35	4.35	4.35	4.60
Tin, New York	**41.75**	40.25	37.90	32.75
Antimony, Hallett, New York	7.87½	8.00	7.75	8.25
Tin plate, 100-lb. box, New York	$3.84	$3.84	$3.84	$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.55c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 1.95c.; Nos. 17 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 20, 2.25c.; No. 30, 2.35c. Three pass cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.20c.; No. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18 to 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in.	64	58	60	54
¾ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

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Plugged and Reamed.

1 to 1½, 2 to 3 in.	Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.
2, 2½ to 4 in.	Lap Weld	

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28; open hearth and chain rods, $28.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, January 18, 1911.—(*By Telegraph.*)

Pig Iron.—The Standard Sanitary Mfg. Company is asking prices on 6000 to 8000 tons or more of Nos. 2 and 3 foundry iron for delivery at its Louisville, New Brighton and Pittsburgh plants. As low as $13.50, Valley furnace, has been quoted on this inquiry on No. 2, while some furnaces quote $13.75 and as high as $14. A steel casting interest is inquiring for 2000 to 3000 tons of basic for delivery at Alliance, Ohio.

While $15, Valley furnace, is still the nominal price of Bessemer, sales are reported of 3000 to 4000 tons at less than this figure. Reports of sales of 4000 tons of basic at $13.65, Valley furnace, are absolutely denied. We quote Bessemer iron nominally at $15; basic, $13.25 to $13.50; No. 2 foundry, $13.75, and gray forge, $13.25, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—We note several small sales of Bessemer and open hearth billets at the regular price of $23, base, and also a sale of 400 tons of open hearth sheet bars at $24. We quote Bessemer and open hearth billets, 4 x 4 in. and up to, but not including, 10 x 10 in., at $23, base, and sheet and tin bars in 30-ft. lengths, $24, f.o.b. Pittsburgh or Youngstown, full freight to destination added. We quote 1½-in. billets at $24 and forging billets at $28, base, usual extras for sizes and carbons, f.o.b. Pittsburgh or Youngstown districts, freight to destination added.

(*By Mail.*)

There is a decidedly better feeling this week, and the large steel interests believe that the tide has turned. One leading interest reports that its bookings show a decided increase over the same period in December, and others state that new orders show a slight increase with inquiries very much better. The feeling is strong that the bottom of the market has possibly been reached, and that there will be freer buying in the future. In spots prices are stronger. Some fairly large inquiries for pig iron are out, one for 6000 to 8000 tons of foundry, another for 1000 tons of basic and several for smaller lots of Bessemer and gray forge. Specifications against contracts for billets and sheet bars are a little better, with indications of further improvement. The orders for steel cars noted in this report have given encouragement to the plate makers, who believe that the long deferred equipment in the placing of cars orders has at last started. Prices on several grades of scrap are stronger, and the feeling in coke is better.

Ferromanganese.—Sales of 700 to 750 tons of foreign 80 per cent. have been made for delivery over all of 1911 at $38.50, Baltimore. This is the lowest price at which ferromanganese has sold for delivery so far ahead for several years. The price for prompt delivery is lower, 80 per cent. foreign for such shipment being quoted at $38. The freight rate for delivery in the Pittsburgh district is $1.95 a ton.

Ferrosilicon.—Prices continue weak, and there is not much new inquiry. A sale of 60 tons of 50 per cent. for forward delivery has been made at $55, Pittsburgh. For prompt delivery the price is lower and we quote at $54. We quote 10 per cent. blast furnace silicon at $23; 11 per cent. $24, and 12 per cent. $25, f.o.b. cars, Jisco and Ashland furnaces.

Skelp.—The market is firmer and 1.25c. on grooved steel skelp is now being named only on very large contracts and for prompt specifications; several makers will not sell below 1.30c. A local pipe mill recently placed a contract for 2000 tons of wide plates to be made up into large sized pipe for a gas line. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Muck Bar.—The A. M. Byers Company has started up 37 of its 42 new puddling furnaces at Girard, Ohio. It now has a total of 86 puddling furnaces there, being the largest puddling plant in the Central West. The puddling plant of the Kittanning Iron & Steel Company, at Kittanning, Pa., has been shut down since January 1. We quote muck bar nominally at $29, Pittsburgh, in the absence of any recent sales.

Steel Rails.—The Carnegie Steel Company has recently taken some fairly large orders for rails for export. Orders received by this company for steel ties during 1910 were considerably heavier than in 1909, with the outlook for a still larger demand this year. The coal mining concerns are placing fairly large orders for light rails, but very little business is coming from the lumber interests. Quotations on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. The prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per pound.

Plates.—Some good sized orders for steel cars were placed in the past week and more are pending. The Pennsylvania Lines West has placed orders for 400 box cars of 100,000 lb. capacity each, 600 G. R. A. composite gondolas and 30 flat cars with the Pressed Steel Car Company. The Pennsylvania Railroad Company, Lines East, has contracted for 600 steel hopper cars with the Cambria Steel Company, 150 with the American Car & Foundry Company and 250 with the Pressed Steel Car Company. The Missouri Pacific Railroad has placed 1000 refrigerator cars and 1000 steel hoppers with the American Car & Foundry Company. Active inquiries in the market include 1500 steel gondolas for the Buffalo, Rochester & Pittsburgh and the same number for the Shawmut & Northern. The Wabash-Pittsburgh Terminal has not yet placed contracts for 2000 steel hoppers, but will do so as soon as certain legal matters have been adjusted. Makers of plates are much encouraged by the activity in steel car orders. The general demand for plates is also showing betterment. Prices are firm, and we quote ¼ in. and heavier plates, in narrow and wide sizes, at 1.40c., Pittsburgh.

Structural Material.—The Oregon Railroad & Navigation Company has placed a contract for the Willamette River bridge with the American Bridge Company calling for about 9000 tons of material. Waddell & Harrington were the engineers. The local situation is quiet but a good deal of big work is coming up, some of which is likely to be placed in a short time. There is, however, a good deal of complaint over the low prices being made on fabricated work. We quote beams and channels up to 15 in. at 1.40c., Pittsburgh.

Sheets.—Makers of sheets report that both new demand and specifications against contracts are showing betterment and that prices are being maintained more closely than for some time. The American Sheet & Tin Plate Company is operating to about 50 per cent. of its sheet mill capacity. The full schedule of prices on the different grades of sheets is printed on a previous page.

Tin Plate.—While the demand for tin plate is rather lighter at present, specifications against the heavy contracts placed in November and early December are now coming in freely, and mill operations are on a heavier scale now than for some time. The American Sheet & Tin Plate Company is operating this week close to 75 per cent. of its tin mill capacity. The Jones & Laughlin Steel Company expects to start work soon on the building of 12 more hot tin mills at Aliquippa, having had this number in operation for some time. Regular prices are reported as being well maintained, and we quote 100 lb. cokes at $3.60 per base box f.o.b. Pittsburgh.

Steel Bars.—New orders and specifications for steel bars are not very active at present, but railroads are specifying more liberally on their contracts for iron bars. The demand for hard steel bars for concrete purposes is lighter than for some time. We quote soft steel bars at 1.40c. and common iron bars 1.35c., f.o.b. Pittsburgh.

Hoops and Bands.—Some heavy contracts for hoops and bands, mostly from the cooperage trade, have lately been placed, specifications against which are now being received. The hoop and band mills are operating at present

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to about 50 per cent. of capacity. We quote hoops at 1.50c.; bands, 1.40c. in carload and larger lots and 1.45c. in small lots, the latter carrying extras as given in the steel bar card dated September 1, 1909.

Spikes.—Several good sized inquiries from Western roads for railroad spikes are in the market. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c. base, in carload and larger lots.

Spelter.—The market continues firm. While there is some inquiry, actual sales are mostly small lots. We quote prime grades of Western at 5.40c., East St. Louis, equal to 5.52½c., Pittsburgh.

Merchant Steel.—New orders continue to be confined to small lots, but specifications against contracts are heavier so far this month than in the same period last month. Prices are fairly firm, and shipments by the mills in January will probably be heavier than in any one month for some time. We quote, f.o.b. Pittsburgh: Iron finished tire, 1½ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Shafting.—Specifications on shafting from the automobile trade are heavier than for some time, and an improvement is also noted in the demand from the implement makers. Prices are reported as being well maintained. The discounts on cold rolled steel shafting are 57 per cent, off in carload and larger lots and 52 per cent. in small lots, delivered in base territory.

Rivets.—The demand is still confined to small lots to cover actual needs, consumers not being disposed to contract ahead. Specifications against orders are only fairly satisfactory. These prices are reported as being well maintained on the basis of 1.90c. for structural rivets and 2c. for boiler rivets.

Wire Products.—Makers of wire nails and wire report that new orders are fair and only for small lots to cover actual needs. Specifications against contracts are not satisfactory, which is disappointing, as it had been believed that by this time the demand would be heavier. Prices are reported as being quite well maintained. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails. $1.70, and cut nails, $1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Iron and Steel Scrap.—A good deal of the heavy steel scrap of the Pennsylvania Lines West, bids on which were opened last week, went to the American Steel Foundries at Alliance, Ohio. Dealers are not trying to force sales of scrap at present, as they believe prices may improve in the near future, while consumers are taking in only such material as they absolutely need. There has been a fairly heavy movement in bundled sheet scrap in the last few days, and prices have advanced from 75c. to $1 a ton. A local dealer reports a sale of bundled sheet scrap at $10 at loading point. We also note sales of 150 tons and of 300 tons of heavy melting scrap at $13.75, delivered, and dealers state that very little scrap can be picked up at less than that price. A sale is also reported of 600 tons of cast iron borings on the basis of $8 Pittsburgh. Dealers quote about as follows, per gross ton, f.o.b. Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.50 to $13.75
No. 1 foundry cast	13.00 to 13.25
No. 2 foundry cast	12.00 to 12.25
Bundled sheet scrap, at point of shipment	9.75 to 10.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	14.75 to 15.00
No. 1 railroad malleable stock	12.75 to 13.00
Grate bars	10.75 to 11.00
Low phosphorus melting stock	17.00 to 17.25
Iron car axles	24.00 to 24.50
Steel car axles	20.25 to 20.50
Locomotive axles	24.00 to 24.50
No. 1 busheling scrap	12.25 to 12.50
No. 2 busheling scrap	8.75 to 9.00
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.00 to 8.10
Machine shop turnings	8.60 to 8.75
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	14.50 to 14.75
Heavy steel axle turnings	10.25 to 10.50

Merchant Pipe.—A few small inquiries ranging from 2 to 5 miles of line pipe are in the market, but new demand is light, and only for small lots. Stocks of pipe held by jobbers and mills being lighter at this time than at any period for some months, it is expected that new buying will be heavier in a short time. The larger mills are reported as operating on the basis of 60 to 65 per cent. of capacity. We are advised that discounts on iron and steel pipe are being fairly well maintained.

Boiler Tubes.—The railroads are showing more disposition to place orders for boiler tubes than for some time, and some fairly large inquiries are in the market. The new demand for merchant tubes continues dull, and discounts on boiler tubes are still more or less demoralized.

Coke.—The Connellsville *Courier* estimates the output of coke in the Upper and Lower Connellsville regions in 1910 as 18,926,491 tons, against 17,785,832 tons in 1909. There are no important inquiries in the market at present for either furnace or foundry coke, but the tone of prices is possibly a little stronger. On Monday the H. C. Frick Coke Company fired up 100 ovens in the Connellsville and Klondike region which have been idle since the holidays. We quote standard makes of furnace coke for spot shipment at $1.40 to $1.50 per net ton, at oven, while for delivery over first half of 1911 from $1.75 to $2 is quoted. Best makes of 72-hour foundry coke for spot shipment are held at $1.90 to $2 per net ton, at oven, and for first half of the year at $2.25 to $2.50.

Chicago

FISHER BUILDING, January 18, 1911.—(*By Telegraph.*)

The favorable indications which appeared in the Chicago market last week have not grown into a buying movement or any marked improvement. The railroad rate cases and the Supreme Court decisions at Washington are nearing a definite conclusion, and after having waited so long buyers are disposed to wait a little longer before committing themselves on contracts for deferred deliveries. However, there is some improvement in railroad buying. No new rail orders of moment are reported, but orders for track supplies are coming out more freely. These are all for prompt shipment. Specifications for bar iron for prompt shipment are also growing, and there are more car inquiries in the market. In the structural field several important contracts of moderate size were let last week in Western cities, and early action is expected on large building contracts pending in Chicago. The smaller fabricating shops are picking up good orders, making a good demand from store as well as from mill for small lots of material. Miscellaneous plate orders are also showing up a little better. The sheet business is confined chiefly to carload orders for prompt shipment. The wire mills are doing better and expect a very satisfactory run of business during the next two or three months, as stocks in distributers' hands are light, and jobbers and retail dealers have been late in placing orders for spring shipment. The pipe foundries booked about 20,000 tons of new business last week, including large lettings in Chicago and Portland, Ore. Municipal bonds are selling better than for a long time, and this will enable Western cities to take up deferred plans for improvements. This improvement in the bond market will soon bring results in the demand for other forms of iron and steel which go into bonded projects. The scrap market continues stagnant, the trading being confined to forced sales of material in transit, on which dealers have to make concessions.

Pig Iron.—Several good inquiries were pending a week ago, but hopes among the iron men of a general buying movement have been disappointing. There is some improvement in the demand for small foundry lots of Northern iron for prompt shipment. The minimum price quoted by local furnaces on round lots is $15.50, Chicago, for No. 2, with a slight advance asked on small lots. They are reluctant to sell for deferred deliveries, and concessions have been limited to sales for prompt shipment. An Ohio furnace has sold 5000 tons of basic to a steel foundry interest at St. Louis, and another steel foundry interest has purchased a smaller lots of basic from a Chicago furnace. The demand for low phosphorus iron for steel foundries is steadier than for malleable or foundry grades. The melt in malleable foundries has been decreased owing to lack of railroad orders, but the steel foundries are steady buyers, usually in small lots for prompt shipment or short delivery periods. Southern iron is weak in spots, but $11, Birmingham, is generally maintained on Alabama iron, for current quarter or first half, with $11.50 asked for second quarter, but buyers are not taking much interest in forward deliveries. Only a few inquiries have come out thus far for the second and third quarter. As a rule buyers are covered for the current quarter and many of them have enough iron bought to carry them well into the second quarter. The prospective requirements of pipe foundries have made the lower grades of Southern iron a little stronger, and several furnaces which have recently sold No. 4 at $10 have raised their quotation 25c. The furnaces realized an average price of $12. Birmingham, or better, on iron delivered in this territory the past year, and they are not pressing the market at present to make forward sales at current quotations. The

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following quotations are for January, February and March shipment, Chicago delivery:

Lake Superior charcoal	$18.00 to $18.50
Northern coke foundry, No. 1	16.00 to 16.50
Northern coke foundry, No. 2	15.50 to 16.00
Northern coke foundry, No. 3	15.25 to 15.75
Northern Scotch, No. 1	16.50 to 17.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	15.50 to 16.00
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	18.40 to 18.90
Jackson Co. and Kentucky silvery, 8%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 10%	20.40 to 20.90

(*By Mail.*)

Billets.—The leading interest continues to quote $31 as the minimum base price on forging billets, but independent mills have made sales at $27 to $28 the past week.

Rails and Track Supplies.—No important rail orders have been closed since those mentioned in last week's report. The railroads are placing good orders for track supplies for prompt shipment, taking this plan of obtaining supplies for immediate use without placing their usual annual contracts. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.20c. to 2.30c., base, all in carload lots, Chicago. Light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb., 1.25c. to 1.29½c., Chicago.

Structural Material.—A marked improvement is shown in the number of structural contracts let. The Sanitary District of East St. Louis has bought three bridges, amounting to 500 tons, from the Joliet Bridge & Iron Works. The Chicago & Northwestern Railroad has let to the King Bridge Company, Cleveland, Ohio, a contract for three bridges, amounting to about 300 tons. The Webster Mfg. Company, Chicago, has awarded to the Toledo Bridge & Crane Company, Toledo, factory construction at Tiffin, Ohio, amounting to about 1000 tons. A smelter at El Paso for the Arizona Copper Company, 300 tons, was let to the Minneapolis Steel & Machinery Company. No awards are reported here on the large buildings that are pending in Chicago, but the tonnage in sight is increasing steadily and all the pending projects are backed by strong interests. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—Local mill interests have no advices to confirm the report that the Missouri Pacific has placed an order for 2000 cars. Specifications for plates from the general trade are a little better this week, but the business continues unsatisfactory. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—There is an increase this week in carload buying. Jobbers show no inclination at present to place contracts for round lots of sheets for deferred deliveries, but there are more current orders for prompt shipment. Prices continue firm. We quote Chicago prices, carload lots, from mill: No. 28 black sheets, 2.38c.; No. 28 galvanized, 3.38c.; No. 10 blue annealed, 1.83c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—The railroads continue to buy bar iron steadily in round lots for prompt shipment, but the business has not grown to a volume that would enable the mills to get better prices. In other directions the bar trade is quiet as there is very little new buying of either soft or hard steel bars. While there has been a considerable decline in prices of re-rolling rails the past two or three months, the mills cannot afford to follow this decline in making prices on bars as they are generally carrying large stocks of rails which will average $2 to $3 higher in cost than the present market quotation. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.30c. to 1.35c.; hard steel bars rolled from old rails, 1.40c. to 1.45c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Wire Products.—Bookings of wire orders for the past three or four months, although sufficient to keep the mills going at about two-thirds capacity, have been below the normal tonnage for this trade. This is not due to any lack of consumption, but was caused by the hesitation of hardware dealers and jobbers in placing orders for spring shipment. During November and December hardware jobbers only booked about half the amount of business for spring shipment that they have been accustomed to take in the past 10 years. It is expected that this condition will result in very active buying during the next two or three months. Spring trade in retail distribution has already opened in the South on a satisfactory basis. Agricultural conditions are so favorable that it is generally believed that the consumptive demand will be normal in all the common wire products, including field fence, poultry netting, wire cloth, &c. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—The contract for 10,000 tons of water pipe for the city of Chicago, which was mentioned last week, was awarded to the United States Cast Iron Pipe & Foundry Company. The same interest was awarded 6000 tons of water pipe at Portland, Ore., and booked other orders which would aggregate 20,000 tons for the week. This is the active season for the sale of both water and gas pipe and good bookings are expected in the next 30 days. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $25; 6 to 12-in., $24; 16-in. and up, $23.50, with $1 extra for gas pipe.

Merchant Steel.—Specifications are coming in at the usual rate from the agricultural trade and there is also some new business, although the yearly contracts in this trade are usually made in the early summer. Jobbers are placing fair orders.

Old Material.—The market continues very quiet. Consumers are carrying good stocks and are disinclined to take on additional tonnage now except when dealers offer bargains. About the only material being sold is scrap in transit, which was purchased from railroads and other sources in November and December. These sales usually result in a loss to the dealer, since the decline during the holidays. A Western road recently sold 400 tons of car wheels at $13.50 per gross ton, Chicago. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	13.50 to 14.00
Old steel rails, less than 3 ft	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	23.00 to 24.00
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards, cut apart	11.50 to 12.00
Shoveling steel	11.00 to 11.50

The following quotations are per net ton:

Iron angles and splice bars	$13.00 to $13.50
Iron arch bars and transoms	14.00 to 14.50
Steel angle bars	11.00 to 11.50
Iron car axles	18.50 to 19.00
Steel car axles	17.75 to 18.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Steel knuckles and couplers	11.25 to 11.75
Locomotive tires, smooth	17.00 to 17.50
Steel axle turnings	7.75 to 8.25
Machine shop turnings	6.50 to 7.00
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	9.25 to 9.75
No. 2 busheling	7.25 to 7.75
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	13.00 to 13.50
No. 1 cast scrap	12.00 to 12.50
Stove plate and light cast scrap	10.25 to 10.75
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	8.75 to 9.25

Jacob J. Cohen has opened an office at 1726 Republic Building, Chicago, as a broker in scrap iron, steel and metals.

Philadelphia

PHILADELPHIA, PA., January 17, 1911.

A more pronounced buying movement in pig iron has developed, but mostly in special grades. As a result of recent sales, one Eastern furnace will probably soon blow in on basic iron. While specifications are somewhat heavier for steel plates, new business continues of an irregular nature. An Eastern builder has a contract for 600 steel cars, part of an order for 1000 placed by the Pennsylvania Railroad. The Chesapeake & Ohio has placed its contract for 15,000 tons of rails, half going to an Eastern and half to a Western mill, while the Southern Railway has an inquiry out for 27,000 tons. A trifle better movement in steel scrap is reported. Iron bars are dull, while heavier specifications are noted for steel bars.

Iron Ore.—No fresh demand has developed. Arrivals of foreign ore at this port during the week aggregated 9650 tons, valued at $26,538.

Pig Iron.—More activity has developed than has been the case for some weeks, and while transactions have been largely confined to specialties and steel-making irons, several very fair inquiries for standard brands of foundry iron have come out. Several sales of basic iron, effected quietly, have just come to light, both buyers and sellers being disinclined to make public the facts regarding these transactions. Sev-

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eral 5000-ton lots of basic iron for deliveries ranging from one to four months have been sold at prices ranging from $14.25 to $14.40, delivered in this vicinity. One round lot was also sold to an Eastern mill on a readjustment basis against unfilled orders still due at a higher price. One sale of 1000 tons of off basic is also reported. A transaction involving 3000 tons of Bessemer iron, sold at a low price, in competition with other grades, is also noted. Negotiations are practically closed for a lot of 3000 tons of low phosphorus iron, for a consumer in this city. Several moderate lots of low phosphorus iron have been sold at prices ranging from $21.50 to $22, depending on the grade, although carload lots have been moved at prices ranging up to $22.50, delivered here. In foundry grades the cast iron pipe makers have been the most active buyers, one Delaware River interest taking 5000 tons of Southern iron for delivery over the next four months, at a basis of $10, Birmingham, for No. 4 foundry; the same purchaser took 5000 tons of Northern iron at prices ranging from $14.25 to $14.50, delivered, according to analysis, while another maker is negotiating for a block of 5000 tons. Malleable iron makers are in the market for several fair sized blocks of iron, and a sale of one lot of 1000 tons of coke malleable has been made at a price lower than recently quoted. A sale of 500 tons of charcoal iron to a malleable foundry is also reported. A more active demand is noted for higher grades of foundry iron, particularly from some of the larger buyers, one interest being in the market for 5000 tons of No. 2 plain and No. 3, while several inquiries are out for 1000 ton lots of various foundry grades. While no sales of forge iron of importance have transpired, inquiries are in hand for several lots, in quantities up to 500 tons; in the absence of sales, it continues to be quoted nominally at $14.25 to $14.50, delivered in this vicinity. Much of the recent business has been done at the expense of prices, particularly for basic iron, but quotations for standard brands of foundry iron are unchanged. The following range of prices is named for standard brands delivered in buyers' yards in this vicinity, shipment during the first quarter or half of the year:

Eastern Pennsylvania, No. 2 X foundry	$15.50 to $15.75
Eastern Pennsylvania, No. 2 plain	15.00 to 15.25
Virginia, No. 2 X foundry	15.80 to 16.00
Virginia, No. 2 plain	15.80 to 16.00
Gray forge	14.25 to 14.50
Basic	14.25 to 14.50
Standard low phosphorus	21.50 to 22.00

Ferromanganese.—Small lot buying continues, although the demand is by no means active. While some sellers are firm at $38.25 to $38.50, Baltimore, for 80 per cent., small sales for prompt delivery are reported at $38.

Billets.—Consumers show more interest in the market, but continue to place orders in small lots for early delivery. Efforts to get price concessions are still being made; but, it is stated, without success, and makers look for a better volume of business in the near future. Quotations are being maintained at $25.40, delivered in this territory, for rolling billets, and $30.40 for ordinary forging billets.

Plates.—Specifications have been coming out more freely and frequently for larger quantities, particularly from the railroads. New business, however, continues of an irregular nature, consumers buying merely for their immediate requirements. Prices are unchanged, 1.55c., minimum, being quoted for ordinary plates delivered in this vicinity.

Structural Material.—The most important contract which will be closed in the near future is that for the superstructure of the new Vine street pier in this city, requiring about 3000 tons. Several other fair sized propositions are pending, but the bulk of the immediate orders are for small quantities. Specifications, however, are reported as coming out more freely. Prices for plain shapes are being firmly maintained at 1.55c. minimum, delivered here.

Sheets.—A better run of orders is coming to the mills, although not sufficient to keep them fully engaged. Consumers usually place orders for small lots for immediate consumption, rather than contract for forward requirements. Manufacturers expect a more active demand in the near future. Quotations are unchanged, Eastern mills naming the following range of prices for early deliveries: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—While the demand is not active, specifications, particularly for steel bars from agricultural implement makers, have been in larger volume. Fresh orders have been confined to small lots, which are being taken at unchanged prices. Refined iron bars are quoted at 1.32½c. to 1.42½c., delivered in this vicinity, according to tonnage and grade; steel bars are firmly held by leading producers at 1.55c., delivered.

Coke.—Negotiations for fair sized lots of furnace coke and moderate quantities of foundry coke are under way, but few sales of importance are reported. In instances prices are a trifle firmer, furnace coke being quoted at $1.50 to $1.65 per net ton at oven, with foundry coke at $2 to $2.25 at oven, dependent on quality, tonnage and range of delivery. The following range of prices is named for deliveries in buyers' yards in this district:

Connellsville furnace coke	$3.75 to $3.90
Foundry coke	4.25 to 4.50
Mountain furnace coke	3.35 to 3.50
Foundry coke	3.85 to 4.10

Old Material.—The market still drags. Slightly heavier sales are reported in some lines, but the demand lacks snap. Several thousand tons of No. 1 heavy melting steel have been taken at about $13, delivered, although small lots can still be picked up at $12.50 to $12.75. Low phosphorus scrap has been sold at $17.50, delivered in this vicinity. Railroad wrought has been sold at $15.50, delivered, although better than that figure was paid for recent railroad offerings. More active buying of turnings and borings has stiffened prices for those grades and quotations are a trifle higher. A waiting market prevails in nearly all grades and quotations are to a large extent nominal. The following range, however, about represents sellers' ideas of the market for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$12.50 to $13.00
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	17.50 to 18.00
Old steel axles	19.50 to 20.00*
Old iron axles	26.00 to 27.00*
Old iron rails	17.00 to 17.50*
Old car wheels	13.00 to 13.50
No. 1 railroad wrought	15.50 to 16.00
Wrought iron pipe	12.25 to 12.75
No. 1 forge fire	11.00 to 11.50
No. 2 light iron	7.00 to 7.50
Wrought turnings	8.25 to 8.75
Cast borings	8.25 to 8.75
Machinery cast	14.00 to 14.50
Railroad malleable	13.00 to 13.50
Grate bars	11.00 to 11.50
Stove plate	10.00 to 10.50

* Nominal.

The blast furnace of the Delaware River Steel Company, Chester, Pa., it is reported, will blow in at an early date on basic iron.

The name of the corporation, Sloan, Howell & Co., 1520 Real Estate Trust Building, Philadelphia, iron, steel and supply merchants, which had recently been changed to Sloan & Co., has been further changed to Burrows, Sloan & Co., owing to the fact that there is in existence in the same city another firm under the style of Sloan & Co. There has been no change in the personnel of the corporation officers or officials.

L. H. Hoskins, who for the past nine years has been connected with Crocker Brothers, pig iron and coke merchants, and during the past five years as salesman with their Philadelphia office, has been placed in charge of sales for the same firm in the Cincinnati territory, with headquarters in Cincinnati, Ohio. C. R. Dimmer, who has been connected with the Philadelphia office for some years, succeeds Mr. Hoskins in that territory.

Cincinnati

CINCINNATI, OHIO, January 18, 1911.—(*By Telegraph.*)

Pig Iron.—The market appears somewhat steadier. A fairly well scattered inquiry is being received, but mostly for small tonnages and short time delivery, although there are several orders pending for larger lots. The St. Louis territory has furnished some business for local agencies, which came principally from agricultural implement and stove manufacturers, and there are yet some inquiries being worked on from that district. A central Ohio melter is in the market for 1000 tons of foundry iron running 2 per cent. and over in silicon. A nearby company is asking for 500 tons of either Northern or Southern foundry. Several small inquiries from Indiana are also receiving consideration. Consumers needing iron are generally proceeding slowly and are only ordering small amounts to fill immediate requirements. While there have been rumors of a cut below $11 at furnace for Southern iron for spot shipment, strictly graded No. 2 foundry is said not to be obtainable at any concession from this figure. Several local foundries have slim stocks on hand, but most of the jobbing foundries have lately been running light and at the present rate of consumption could go much longer before making any purchases. The pipe interests are understood to have bought freely in other markets. A number of requests for prices on deliveries extending through the third quarter have been coming in, but furnace operators are not in so receptive a mood as they were recently and are generally declining to quote beyond July 1. For first half shipment we quote No. 2 foundry at $11, Birmingham, and $14, Ironton, and malleable around $14 to $14.25, Ironton, with only small lots being

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moved. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for first quarter:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.00 to 13.50
Ohio silvery, 8 per cent. silicon	18.20 to 18.70
Lake Superior coke, No. 1	15.70 to 16.20
Lake Superior coke, No. 2	15.20 to 15.70
Lake Superior coke, No. 3	14.70 to 15.20
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	19.50 to 20.50

(*By Mail.*)

Coke.—More interest is taken in furnace coke than in foundry grades, and another inquiry is reported to be out from a Northern furnace for about 7000 tons per month for first half delivery. However, the furnace operators are extremely slow in closing contracts. In both the Pocahontas and Wise County fields there has been a stiffening in prices for spot shipment, which is due to the curtailment in production inaugurated by several operators and not to any increased demand. Some brands of furnace coke that could have been bought at $1.50, and possibly a little lower 30 days ago, are now not obtainable below $1.65 to $1.75 per net ton at oven in the Wise County and Pocahontas districts. Foundry coke is available in all three fields at $1.95 to $2 for spot shipment and at $2.15 to $2.25 per net ton at oven on contracts running through the first half.

Finished Material.—Plans that are being made up for rebuilding the numerous structures that have lately been destroyed by fire in Cincinnati indicate that the present year will be a good one for disposing of a large tonnage of beams, channels and reinforcing concrete bars. No change in prices has been made, and 1.40c. for steel bars and structural material still governs, with warehouse prices around 1.75c. to 1.90c.

Old Material—Business seems to have revived somewhat, and some round lots of scrap have lately been taken by the rolling mill interests. There is also a better inquiry from the foundry trade. The Norfolk & Western Railroad Company has a list out offering about 5000 tons of scrap. Offerings are expected from some of the other roads operating in the South. Prices for delivery in dealers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$12.00 to $12.50
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 6.50
No. 1 cast scrap, net ton	11.00 to 12.00
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.50
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	11.50 to 12.00

Birmingham

BIRMINGHAM, ALA., January 16, 1911.

Pig Iron.—A lot of 500 tons of No. 2 soft for first half delivery was sold the past week at $11, Birmingham, and two lots of 100 tons each of No. 2 foundry for shipment during the next four months brought the same price. The sale of a small lot of high silicon iron is reported at about $12, and forge and mottled grades in carload lots brought a No. 4 foundry price. An aggregate of 1250 tons of charcoal iron was sold at $22.50, at furnace. The reported sale of a round tonnage of low grade foundry iron to a leading pipe manufacturer cannot be confirmed in this market, and by reason of the scarcity of such grades it is quite probable that the tonnage was placed elsewhere. Negotiations for 1000 tons of Nos. 2 and 3 foundry for shipment during the first half have not been closed, but 500 tons of analysis iron for comparatively early shipment will no doubt be placed to-day. The inquiry from all quarters of the trade has improved materially and in practically all cases requirements are being submitted in definite form. One of the most attractive tonnages recently offered was to cover the requirement of a leading Southern melter for the whole of this year. It is not believed that any selling interest would name a price for shipments further advanced than the first half, and even for second quarter deliveries it is not improbable that an advance of 50c. per ton over the $11 schedule will become effective. The disposition to speculate at present prices has become general with the merchant interests, but the tonnage recently added to such holdings is very small. It is noted that none of the cash offers at a price below an $11 basis for spot shipments has been accepted, and that the demand for warrants is decidedly stronger. One of the smaller producers has practically withdrawn from the market for any delivery, and another concern now offers only such tonnage as is on furnace yards and not applicable to orders. A leading producer will not accept additional contracts for first quarter shipment, owing to the condition of the order book when compared with the present rate of production, and is making no preparations for an increase in the active producing capacity. The capacity for the production of basic will be increased early in February.

Cast Iron Pipe.—In addition to the tonnage recently mentioned as required for Western points, the city of Kansas City, Mo., is soon to place a contract for 2000 tons of water pipe. Production has been reduced by the closing down of two local plants for repairs. It is understood that they will be out of commission for some two months and that by reason of the suspension the surplus stock is really very small. An advance in quotations has recently been made and the revised quotations have become established for small orders. We quote as follows, per net ton, f.o.b. cars here: 4 to 6 in., $20 to $20.50; 8 to 12 in., $19.50 to $20; over 12-in., average $18, with $1 per ton extra for gas pipe.

Old Material.—There is more demand, but the matter of prices is still undetermined. Dealers are disposed to treat all inquiries individually and the buying interests are following a very conservative course. The consumption is considerably larger than for a month past, but the stock in consumers' hands has not been reduced to an appreciable extent. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$14.00 to $14.50
Old iron rails	12.00 to 12.50
Old steel axles	14.00 to 14.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	7.50 to 8.00
No. 2 country	7.00 to 7.50
No. 1 Machinery	9.50 to 10.00
No. 1 steel	10.00 to 10.50
Tram car wheels	9.00 to 9.50
Standard car wheels	10.00 to 10.50
Light cast and stove plate	8.00 to 8.50

The plant of the Dimmick Pipe Company at North Birmingham, Ala., has been closed down for repairs.

The soil pipe plant of the Beggs Pipe & Foundry Company at North Birmingham, Ala., is again in operation after a suspension of some weeks.

The plant of the Smith Mfg. Company at Bessemer, Ala., has been leased by the Bessemer Castings Company and will be operated in the production of stoves.

Cleveland

CLEVELAND, OHIO, January 17, 1911.

Iron Ore.—Some inquiry for small lots came out during the week and it is expected that these will result in the placing of contracts within a few days. Sellers will arrange with buyers to pay the price that may be established later. It will probably be several weeks before any definite action is taken on prices. Ore shipments from docks are light but about normal for this season of the year. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—Inquiries for foundry iron show considerable improvement, and the general feeling is somewhat brighter. While sales during the week were limited to small lots, sellers are now looking for a better volume of orders. New inquiries have come largely from the Pittsburgh district, the largest being for 5000 tons. A Cleveland foundry wants about 1000 tons of Southern for the first half and a northern Ohio consumer is in the market for 500 tons of gray forge. In order to clean up a portion of its yards, a local furnace interest has sold some small lots of foundry iron at a concession from ruling prices for spot shipment, but these quotations have now been withdrawn. Prices for local delivery are firm at $14, at furnace, for No. 2 for the first half. For outside shipment, however, quotations as low as $13.50 are being made by local furnaces for No. 2 for the same delivery. Southern iron is not firm at $11, Birmingham, for No. 2, some selling agencies quoting $10.75 for the first half. For prompt shipment and the first half we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	14.50
Northern foundry, No. 2	14.25
Northern foundry, No. 3	14.00
Gray forge	14.00
Southern foundry, No. 2	$15.10 to 15.35
Jackson Co. silvery, 8 per cent. silicon	19.00

Coke.—The demand for foundry grades shows improvement. Some contract business that has been pending for several weeks has been placed and a few foundries that have been holding off have come into the market with inquiries for first half delivery. Prices remain stationary. We quote standard Connellsville furnace coke at $1.45 to $1.50 per

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net ton, at oven, for spot shipment, and $1.75 to $1.85 for the first half. Connellsville 72-hour foundry coke is held at $2 to $2.15 for spot shipment and $2.25 to $2.50 for the first half.

Finished Iron and Steel.—A decided improvement is observed, orders being more numerous and for larger tonnages. The greater part of these orders have been new business. It is too early to determine, however, whether the revival will be permanent or only a spurt due to holding off from placing orders during inventory time, and until it was known whether prices would be reduced as a result of the recent conference in New York. The better demand is mostly in steel bars and structural material. Some good orders for light rails were also placed, coming from coal mining companies. The structural situation has improved somewhat, several inquiries now being figured on for building work requiring about 1000 tons. None of the prospective work requiring large tonnages has reached the point of asking for bids. Prices on steel bars, plates and structural are firm, at 1.40c., Pittsburgh. While sheet prices appear to be maintained by most of the mills, an inquiry from an Ohio stove manufacturer for a 300-ton lot is said to have brought out concessions from ruling quotations. The demand for iron bars is only moderate. Prices are unchanged, at 1.30c. to 1.35c., at mill.

Old Material.—The market continues very dull. Consumers are taking some material on contracts, but very few sales are being made. Dealers generally are holding their scrap for better prices, but the light demand has caused further weakness and several quotations have been reduced from 25c. to 50c. a ton. The Michigan Central Railroad received bids January 17 on a small list. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$13.75 to $14.25
Old iron rails	15.00 to 15.50
Steel car axles	18.50 to 19.00
Heavy melting steel	12.00 to 12.50
Old car wheels	12.00 to 12.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	11.75 to 12.00
Railroad malleable	12.75 to 13.00
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	6.50 to 7.00
Steel axle turnings	8.75 to 9.00
No. 1 busheling	10.50 to 11.00
No. 1 railroad wrought	12.00 to 12.50
No. 1 cast	11.50 to 12.00
Stove plate	10.00 to 10.50
Bundled tin scrap	11.00 to 11.50

Harry O. Price, formerly manager of the Pittsburgh office of C. H. Lewis & Co., has opened an office under the name of Price & Co., at 711 Citizens Building, Cleveland, for the sale of pig iron and coke. Mr. Price has been appointed selling agent of the Globe Iron Company, Jackson, Ohio, for the Cleveland and Pittsburgh territories.

Buffalo

BUFFALO, N. Y., January 17, 1911.

Pig Iron.—The week has shown a large increase in inquiry and the development into orders of a good proportion of the previous week's inquiries, the sales reaching a total of nearly 10,000 tons. Some of this business was brought about by price concessions. The aggregate of new inquiry totaled about 25,000 tons, made up principally of foundry grades, desired by pipe works, agricultural implement makers and electrical interests, including one inquiry for several thousand tons from a New England concern for foundry irons. Very little is being done in malleable. In basic, the only business reported is for small lots. A good deal more charcoal iron is being bought than for some time, quotations on which now range from $17.25 to $17.75, f.o.b. Buffalo, which are a little under recent prices. Most items of the price schedule have been scaled down somewhat from the figures which the furnacemen have been endeavoring to maintain, with less price variation between the regular grades, there being practically not more than 50c. per ton difference between the highest and the lowest grade in foundry irons, and only 25c. per ton between No. 2 X and gray forge, quotations being based not so much upon the regular grades as upon the special requirements of the buyer for his particular use. We quote as follows, f.o.b. Buffalo, for prompt and first half deliveries:

No. 1 X foundry	$14.50 to $15.00
No. 2 X foundry	14.00 to 14.50
No. 2 plain	14.00 to 14.25
No. 3 foundry	13.75 to 14.00
Gray forge	13.75 to 14.00
Malleable	14.25 to 14.75
Basic	14.50 to 15.00
Charcoal	17.25 to 17.75

Finished Iron and Steel.—The agency of the principal interest reports a perceptible increase in inquiry since the meeting of steel manufacturers and a better volume and more varied line of orders, including, in addition to miscellaneous bar products, 2800 tons of steel rails, large orders for special track material for traction lines (intersection cross overs and other built-up work), girder rail sections, &c., also for Canada a large tonnage of billets, with negotiations pending for a much larger quantity, and a large tonnage of axles and steel wheel equipment for two traction lines and one steam road. An active movement in tin plate is a feature of the Canadian market, inquiries for several thousand tons being out for delivery over the first half of the year, and orders for some of this will, it is expected, be placed during the coming week. There is a strong probability that contracts for much of this tonnage will come to United States makers, owing to the fact that Welsh makers are busily engaged on contracts for European markets and have recently advanced their prices. In structural lines a fair amount of business is being done. Walter Bradley & Co., Fulton, N. Y., have been awarded contract No. 80 on the Oswego branch of the Erie Barge Canal, which includes about 250 tons of structural steel—principally for lock gates—and the Crowell-Sherman-Stalter Company, Cleveland, Ohio, has taken contract No. 48, covering work near Lyons, which includes 200 tons of steel for bridge work and 500 tons for lock gates and about 50 tons of concrete reinforcing bars. The Phœnix Iron Company has been given contract for a small tonnage of steel for the Eastman Kodak Company's factory Building, No. 31, at Rochester. Bids for the 600 tons for the larger building, the Eastman Company, is to erect are held over until next week, as the substitution of reinforced concrete is under consideration, as well as for an additional small building. Bids are being received for steel for an additional mill for the Rome Wire Works, Rome, N. Y., and for a large steel frame factory for the Loritz-Tensch Company, Utica, N. Y.

Old Material.—Very little new inquiry is noted except in machinery cast scrap which shows some improvement in demand and on which the price is slightly higher. Mills continue to take in shipments more freely on current contracts. Since the embargo has been lifted at Pittsburgh on borings and turnings, shipments are moving somewhat more freely in this commodity. For most of the list prices remain practically unchanged. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.00 to $12.25
Low phosphorus steel	17.25 to 17.50
No. 1 railroad wrought	15.00 to 15.50
No. 1 railroad and machinery cast scrap	14.00 to 14.50
Old steel axles	18.50 to 19.00
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	10.00 to 10.25
Locomotive grate bars	10.50 to 11.00
Pipe	9.75 to 10.00
Wrought iron and soft steel turnings	7.00 to 7.25
Clean cast borings	6.25 to 6.50

St. Louis

ST. LOUIS, MO., January 16, 1911.

Satisfactory evidence of the progress of general business in this section toward a better basis is shown by the fact that bank clearings in this city, Kansas City and St. Joseph were in excess of the corresponding week of 1910. The outlook in the pig iron market is for a better demand in the near future, though there is no improvement in prices. Railroad purchases of finished metals are increasing. Building operations for the spring season are developing rapidly. The Southwest reports of new enterprises in manufacturing show a good increase since the turn of the year.

Pig Iron.—While the leading sellers report an increasing interest in the pig iron market, as evidenced by numerous inquiries, the result in sales is disappointing. There is some difference in opinion respecting the requirements of consumers in St. Louis and vicinity for the near future, but it would seem that large local consumers are pretty fully stocked. In St. Louis territory, however, there is considerable business expected to develop from these inquiries. The merchant sellers are putting out their traveling salesmen and the volume of trade is expected to gradually increase from now forward. One of the leading brokers reports inquiries for Southern foundry iron aggregating 2500 tons, with sales of 500 tons of No. 2 foundry for shipment over the first half. An Illinois car wheel company purchased 300 tons of Northern charcoal iron and is in the market for 500 tons of coke iron. The representative of a leading Birmingham interest reports the sale of 500 tons of Southern No. 2 foundry for shipment over the first half. While $11, Birmingham, is regarded as the market for Southern No. 2 foundry for shipment over the first half and $11.25 to $11.50 for the second quarter only, offers of

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less than the first named price are reported to have been taken by some furnaces, but this shading is claimed to be growing less frequent. Shipments on contracts are being freely made.

Coke.—Though inquiries for coke are more frequent than for some weeks, business is of a hand-to-mouth character. Specifications on contracts are coming in satisfactoriiy. The market is ruling steady to firmer. Best selected 72-hour Connellsville foundry is held at $2.25 to $2.35, per net ton; standard grades, $2.10 to $2.25, f.o.b. oven.

Finished Iron and Steel.—The leading interest reports the demand for standard rails quiet, but a fair inquiry for light rails. Structural material is dull. For bars there is a good inquiry from wagon manufacturers and agricultural implement makers. With jobbers the stock taking period had held up the demand. The call for track material is light.

Old Material.—Dealers report more business in sight from consumers, though for the time being the demand is limited. The only railroad list for the past week was that of the Cotton Belt, about 250 tons. The market is fairly steady. We quote dealers' prices, per gross ton, f.o.b. St. Louis:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	12.00 to 12.50
Old steel rails, less than 3 ft	12.00 to 12.50
Relaying rails, standard sections, subject to inspection	24.00 to 24.50
Old car wheels	12.50 to 13.00
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards, cut apart	11.50 to 12.00

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	18.00 to 18.50
Steel car axles	17.00 to 17.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Railway springs	10.00 to 10.50
Locomotive tires, smooth	15.50 to 16.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	10.00 to 10.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	8.00 to 8.50
Pipes and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.00 to 7.50

Harry Benjamin has taken offices 727-728 Central National Bank Building and will engage in the business of handling scrap iron, steel and relaying rails, together with railroad equipment, under the style of the Harry Benjamin Equipment Company. Mr. Benjamin was connected with the Block-Pollak Iron Company, which has recently given up its office in St. Louis, for upward of 30 years. H. J. Keiner, who was also connected with the Block-Pollak Iron Company, will be associated with the new company on February 1.

The officials of the Burlington Railroad are entertaining a proposition for building new terminal facilities at Quincy, Ill., which will involve an outlay of $500,000.

P. B. Hanson, manager of the Johns-Manville Company of Texas, has announced that the company will erect a fireproof building, of probably six stories or more, in the near future at Dallas, Texas.

The William Barr Dry Goods Company, St. Louis, is completing arrangements for the construction of a 20-story building to cover the whole block bounded by Olive, Locust, Sixth and Seventh streets.

San Francisco

SAN FRANCISCO, CAL., January 11, 1911.

It is still too early in the year for any general activity, though mill representatives are figuring on numerous inquiries and a substantial volume of business is expected before the end of the first quarter. Distributive trade has improved materially in several lines of finished materials. Underlying conditions have been greatly improved by a timely general rain, though the crop outlook is not yet assured. The building situation is encouraging, and some expansion is noted in several manufacturing industries.

Bars.—For soft steel bars there is some inquiry of a fairly important nature. Few of the local merchants are carrying heavy supplies and considerable buying for stock is expected within the next month. Some jobbers are buying in small lots to cover immediate requirements, the aggregate tonnage being larger than for some time, as assortments were fairly complete up to the end of the year. As far as can be learned, there is less disposition to order foreign material than there was a year ago. Numerous inquiries, both large and small, are coming out for reinforcing bars, and while foreign material is extensively used for this purpose, representatives of American mills expect to book a very fair tonnage. A large amount of concrete construction is planned and the movement of cement is much heavier than usual at this season. The city of Los Angeles has taken bids on about 45,000 round steel bars. Bars from store, San Francisco, are quoted at 2.10c. for iron and 2.30c. for steel.

Structural Material.—The official record of building values in San Francisco for December, though somewhat below that of a year ago, shows a gain of nearly $500,000 over the preceding month, and local fabricators anticipate a gradual improvement for the next nine months. The December record of $4,715,420 at Portland, Ore., was due to the new building code which went into effect January 1 and is not a true index to conditions there, though the outlook for the year is very favorable. Records in other coast cities show a seasonable decrease, but many important plans are coming up for figuring, especially at Los Angeles. The Vulcan Iron Works, Seattle, Wash., has a contract for about 800 tons for the Bon Marche department store at that city. The only local contract of any consequence is the Terminal Hotel building, about 400 tons, to be fabricated by Dyer Bros. The Mortenson Construction Company of this city has a small order for a bridge at San Luis Obispo, Cal., and it is reported that the steel has been ordered for the Sacramento Court House. Figures are about to be taken on a new drawbridge at Sacramento, Cal. Buildings on which figures will be taken shortly include the Van Nuys Building at Los Angeles and another addition to the Court House at Portland, Ore. Plans have been completed for Pier 32, San Francisco, which will require considerable fabricated material, in addition to reinforcing bars, &c. It is possible that the new St. Luke's Hospital building may be started within the year. The California Agricultural Society is planning a large steel grandstand and building at Sacramento. At Portland, Ore., plans have been filed for a 10-story building for T. B. Wilcox, and figures are being taken on the Lincoln High School. The Masons at Salem Ore., are planning a $100,000 lodge building. Several prospective local jobs are in about the same position as previously reported. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.60c.

Rails.—Few orders of consequence have been placed since the first of the year, though there have been a number of more or less tentative inquiries in the market for some time. A fair amount of small business has been booked and the outlook for the next three or four months is favorable, as many logging concerns are coming into the market for their year's requirements. There have been several reports of projected extensions of new lines from the Middle West into California, and the Western Pacific interests are said to be figuring on a line through the San Joaquin Valley. The demand for light rails is limited at the moment, but there is some inquiry from mining interests and an active movement is expected during the spring. The city of San Francisco is in the market for about 10,000 tons of supplies, including plates, rods, poles and wire, for the Geary street line.

Plates and Sheets.—A substantial tonnage of tank plates has been ordered recently for new gas holders, &c., the demand in southern California being especially active. There are still a number of inquiries for this class of work and considerable business in the oil fields is in prospect. Riveted pipe is also in general demand all over the coast. The distributive movement of black and galvanized sheets is about normal for this season. Merchants are carrying light supplies, but are buying only for immediate requirements, expecting to get lower prices on large orders. The Pacific-American Fisheries is planning to erect a large oil tank at Bellingham, Wash. It is reported that the Standard Oil Company will erect a large refining plant, similar to that at Richmond, Cal., in southern California. The American Beet Sugar Company will erect a 35,000-bbl. oil tank at Oxnard, Cal.

Merchant Pipe.—The small jobbing movement remains rather quiet and only a moderate demand is expected during the first quarter. Dealers are buying from hand to mouth, with little stock in reserve, and show no inclination to alter their policy. A fair tonnage has been booked in the oil fields and the inquiry from that quarter is increasing, though the rain is likely to delay deliveries. There is a prospect of some large orders from gas interests in southern California. The city of Los Angeles has taken bids on 18,500 small fittings and 6500 nipples. There is an active demand for valves and hydrants.

Cast Iron Pipe.—While figures are being taken on a number of large inquiries, the January business so far has been confined to small lots. The Long Beach Consolidated Gas Company has ordered 700 tons of large pipe and will be in the market for more. An order is also expected from the city of Los Angeles for 1000 tons. The Pacific Gas &

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Electric Company is planning large extensions at several points and is likely to be a large buyer throughout the year. It is now taking figures on about 8 miles of pipe. The town of Vallejo, Cal., will take bids January 23 for a lot of water pipe, and the town of Brawley, Cal., is in the market for a considerable tonnage. The Bay Cities Water Company is preparing to start work on its system in Alameda and is negotiating for a yard for the storage of pipe. The San Francisco Bridge Company is taking figures on a lot of cast iron pipe, in addition to other supplies, for the dry dock at Pearl Harbor, T. H.

Pig Iron.—While some large inquiries for castings are coming up, the work of local foundries is mostly of a small nature and limited in quantity. It is difficult to interest local melters in foreign pig iron for future delivery, and the spot market is quiet, though the movement is a little larger than last month. Arrivals of foreign iron have been light for some time, the only recent cargo being 700 tons from Rotterdam. Southern foundry iron is quoted at $21.50 to $22, with very little demand. English and Continental foundry iron is held at about $22. The San Francisco Bridge Company is in the market for a heavy tonnage of special castings, principally iron, for the Government dry dock at Pearl Harbor, but it is very doubtful whether the contract will be placed here.

Old Material.—Cast iron scrap finds a little more demand, but the movement is not heavy, offerings of good material being small. Steel melting scrap is in good demand, with some new contracts for extended delivery. Other lines remain quiet. Prices are quoted as follows: Cast iron scrap, per net ton, $18; steel melting scrap, $12.50, per gross ton; wrought scrap, $13.50, per net ton; rerolling rails, $15, per net ton.

New York

NEW YORK, January 18, 1911.

Pig Iron.—Inquiry has increased since the opening week of the year, but where buying has followed it has been at new concessions in price. The largest transaction reported is for 5000 tons of foundry iron, taken by an eastern Pennsylvania interest. Deliveries extend over three months, beginning with February. A New Jersey buyer closed for 1000 tons of charcoal iron and some sales of charcoal grades were made for eastern Pennsylvania delivery. A valve company is inquiring for 1000 tons and a New Jersey inquiry for several thousand tons has gone the rounds for several weeks without a purchase. The General Electric Company has closed for a part of the iron it has been considering for some weeks. Only one considerable sale of basic iron has been made—about 5000 tons—since three lots, amounting to 10,000 tons, were closed two weeks ago at about $14.25, delivered in eastern Pennsylvania. Pipe companies have been ready to take bargain lots and are hunting for several thousand tons. One sale of 5000 tons of Southern No. 4 has been made at $14.20, delivered on the Delaware River. Virginia sellers have not been aggressive since the marketing of the cheap iron that came from that quarter in December. We quote for tidewater delivery as follows: Northern No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.50 to $14.75; Southern No. 1 foundry, $15.50 to $15.75; No. 2, $15 to $15.25.

Steel Rails.—Small lot business is all that the mills of the leading interest have actually booked in the past week—less than 2000 tons for three mills. Some fair sized inquiries are pending. The Norfolk & Western's order for 1911 was largely rolled in the latter part of 1910, but several thousand tons taken by an Eastern mill is yet to be rolled. Export business has been good, a 15,000 ton and a 5600 ton order having been booked for lines in the Argentine Republic and 5000 tons for Mexico.

Ferroalloys.—Sales of good round lots of 50 per cent. ferrosilicon have been made in the New York market at $56, Pittsburgh. New York dealers' quotations are more uniform. Those who were asking $55.50 have raised their quotations to $56, while others who were high have made reductions. Sellers of foreign ferrosilicon are apparently readjusting their affairs to meet the new condition caused by the selling agreement made among European producers and some of them are not particularly desirous of making sales at this time. Ferromanganese is inactive and is generally quoted at $38, Baltimore, for spot delivery.

Finished Iron and Steel.—Although business has not improved to any noticeable extent, sellers appear to be encouraged by the outlook and confident that further waiting for price reductions will be abandoned. Stocks are low and material for new work is needed, and some deferred orders must soon be released, but buying so far is practically all for immediate requirements. Specifications on steel bars have not been liberal, but the implement trade has been doing exceedingly well, and from this quarter good contracts should be forthcoming. Local offices of steel bar mills report better business in the last week or two than in the previous two or three months. Bar iron orders are reported a trifle better than a week ago, but there is still no marked activity. The week has developed little in structural lines and few decisions have been reached on contracts pending. No award has been made on the bids for the Bureau of Printing and Engraving at Washington, D. C. Woodbury & Layton were low bidders and the highest bid was over $1,000,000 more than theirs. It has been definitely announced that the Appraiser's Store in Boston will be redesigned, for it will be remembered that all of the bids exceeded the appropriation. The New York Central has made no important awards on its contracts and has come into the market for a few more small bridges. The Boston & Maine has awarded a 300-ton bridge to the McClintic-Marshall Construction Company. The Norfolk & Western has made an award on one of its contracts, 800 tons, to the Phoenix Bridge Company, and 1600 tons to the Virginia Bridge & Iron Company, leaving still to be placed by this road between 8000 and 9000 tons. The American Bridge Company has submitted a bid on 2400 tons for a building for the Corn Products Company in Chicago. Prices remain unchanged, as follows: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.35c. to 1.40c., all New York. Plain material from store, New York, 1.85c. to 1.95c.

Cast Iron Pipe.—Angola, N. Y., has awarded the contract for construction of its water works to Mahoney & Swanson, Jamestown, N. Y. The plant will cost $55,000, including pumping equipment, and about 900 tons of cast iron pipe will be required. Public lettings are still few in number. Private companies, however, continue to make inquiries for their season's requirements and some buying is being done by such interests. Carload lots of 6 in. are quoted at $22 per net ton, tidewater.

Old Material.—Shipments are now regularly going forward to fill contracts, consumers taking the full quantities thus covered. Dealers are feeling rather hopeful, believing that while current buying is light the demand must shortly improve. The volume of business is so far showing but a small increase, the demand being most marked for cast scrap and old car wheels. The low prices now prevailing are causing holders to refrain from pressing scrap on the market. The railroad companies are showing a strong disposition to avoid sacrificing their old material, as in some instances the bids received on the monthly lists were not accepted. Quotations per gross ton, New York and vicinity, are as follows:

Old girder and T rails for melting	$10.00 to $10.50
Heavy melting steel scrap	10.00 to 10.50
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	20.50 to 21.00
Old steel car axles	15.00 to 15.50
No. 1 railroad wrought	11.75 to 12.25
Wrought iron track scrap	10.75 to 11.25
No. 1 yard wrought, long	10.50 to 11.00
No. 1 yard wrought, short	10.00 to 10.50
Light iron	5.00 to 5.50
Cast borings	5.50 to 6.00
Wrought turnings	5.25 to 5.75
Wrought pipe	9.50 to 10.00
Old car wheels	11.50 to 12.00
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.50 to 10.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	12.00 to 12.50

Metal Market

NEW YORK, January 18, 1911.

THE WEEK'S PRICES

Cents per Pound, for Early Delivery.

	Copper.			Lead.		Spelter.	
Jan.	Lake.	Electrolytic.	Tin. New York.	New York.	St. Louis.	New York.	St. Lou's.
12	12.75	12.50	{39.75 / 39.95}	4.50	4.35	5.55	5.40
13	12.75	12.50	40.15	4.50	4.35	5.55	5.40
14	12.75	12.50	....	4.50	4.35	5.55	5.40
16	12.62½	12.37½	40.90	4.50	4.35	5.55	5.40
17	12.75	12.40	41.60	4.50	4.35	5.55	5.40
18	12.75	12.50	41.75	4.50	4.35	5.55	5.40

Good copper buying yesterday strengthened its price. Pig tin prices continue to soar because of excited speculation in the London market. Antimony is unsettled and weaker than last week. Lead is softer. Spelter is quiet but steady.

Copper.—A decline in the copper market which resulted in establishing the price of 12.37½c. for electrolytic copper and around 12.62½c. for lake was checked yesterday through a buying movement, which resulted in liberal bookings. Before the day was out the market had advanced ⅛c., and it opened strong this morning with consumers still making inquiries. It is not known what amount of buying was done during the trading yesterday, but it easily reached 5,000,000 lb. Orders were placed for copper for delivery over February, March and April, but a large amount of the buying was for spot supplies and a great deal of it was for domestic consumption. A feature of the day's trading was

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the fact that prices advanced 2½ points at a time. This is unusual in the copper market, as invariably the price advances or recedes ⅛c. at a time. Electrolytic copper is firm to-day at 12.50c., and lake at 12.75c. Some brands of lake cannot be had under 12.87½c. The exports of copper so far this month have been good, amounting to 17,485 tons. In London to-day spot copper sold at £56 and futures at £56 17s. 6d. The sales amounted to 500 tons of spot and 800 tons of futures. The market closed dull. Sales of electrolytic copper were reported in New York this afternoon at 12.55c.

Copper Averages.—The Waterbury average for December was 13c. The average price, New York, for lake copper for that month was 13c., and the average price for electrolytic copper was 12.87½c.

Pig Tin.—Wild speculation in the London market has resulted in further advances of pig tin prices here. Private cables to New York houses with London connections advise that those in charge of the syndicate are now calling for rights to purchase additional supplies of spot tin under agreements made a couple of months ago, when they placed orders with the reservation that they be allowed later on to duplicate their buying at the price agreed upon at that time. This has obliged a number of traders to go into the market to purchase spot tin, and as the syndicate operators are largely in control of the available stocks many dealers who have been caught short are attempting to effect a settlement. This condition resulted in an advance of £7 in the London market during the trading on Monday and Tuesday and a new record figure was established in the New York market. Local transactions are light. Prices here closely follow the London movements, advancing accordingly, but both consumers and dealers are afraid of the market. The syndicate operators are guarding their movements and no one can tell when they may decide that they have squeezed enough out of their operations. Tin in New York this morning was quoted at 41.60c. So far this month 2707 tons have been imported and there are 3116 tons afloat. Pig tin was sold in New York this afternoon for 41.75c. At the close of the London market to-day spot tin was being sold at £190 12s. 6d. and futures at £190 15s. The sales amounted to 2[illegible] tons of spot and 500 tons of futures. The market was steady.

Tin Plates.—Quotations on foreign tin plates again advanced 3d. to-day because of the prevailing high quotations on pig tin. Consumers' stocks are said to be low in Great Britain, and an excellent demand exists there for tin plates. The market in domestic tin plates is quiet, but inquiries are being received from can manufacturers. The quotation for 100-lb. coke plates is $3.84.

Lead.—Lead is softer in tone in the New York market, but the price has not changed from 4.50c. There are reports from St. Louis to the effect that offerings are being made there at 4.32½c., but these are said to be resale lots. Most St. Louis dealers are asking 4.35c.

Spelter.—Consumers of spelter and those who have it for sale seem to be deadlocked. A few prospective buyers who felt the market in New York this week were unable to obtain any concessions on prices made a week ago. Dealers who are loaded down with stocks declare that they will carry them for several weeks rather than accept any lower figure than the prevailing quotations, which are 5.55c., New York, and 5.40c., St. Louis.

Old Metals.—Not enough buying is being done to establish values. Dealers' selling prices are nominally unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.00 to 11.25
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Antimony.—Rumors regarding the formation of a syndicate among the European manufacturers of antimony have greatly unsettled the market which, after having been devoid of interest for several months, has assumed a lively tone reminiscent of other years when speculation in antimony was more prevalent. Following the sudden advance of last week, when Cookson's went to 8.25c. and Hallett's 8c., Hungarian grades advanced accordingly and transactions in that class of antimony were made at 7.50c., which was ⅛c. higher than the metal has been selling for in some time. There was a slight recession in Hallett's and Hungarian grades on Saturday and Monday. The prevailing price for Hallett's is about 7.87½c. It might be obtained from some dealers at ⅛c. lower than that. The Hungarian grades are from 7.25c. to 7.50c. and Chinese grades are offered at around 7.50c. to 7.75c.

Metals, St. Louis, January 16.—Lead is quiet, at 4.35c. to 4.37½c. Spelter is stronger and held at 5.40c. to 5.45c., both at East St. Louis. Zinc ore is quoted at $40 to $43 per ton, Joplin base. With favorable weather the output will be increased. Tin is higher, quoted at 40.85c. per pound; antimony (Cookson's) stronger, at 8.60c.; lake copper weaker, at 13.10c.; electrolytic, 12.98c., all at St. Louis. The demand for finished metals is gaining in volume and a feature is the increase of business with railroads and railroad supply houses.

Metals, Chicago, January 17.—A fair amount of business is being done, principally for spot or prompt delivery. Casting copper in second hands has been selling recently a shade below the figures maintained by the leading producers, but there has not been enough of this business done as yet in Chicago to establish the market at a lower quotation. Tin is being purchased only for immediate requirements, but is quoted higher. Spelter is dull, with no change in the price. We quote Chicago prices as follows: Casting copper, 12⅞c.; lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 41½c.; small lots, 43c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding, 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.50c. to 5.55c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¼c.; copper bottoms, 10c.; copper clips, 12c.; red brass, 10½c.; yellow brass, 9c.; lead pipe, 4⅜c.; zinc, 4¼c.; pewter No. 1, 26c.; tin foil, 30c.; block tin pipe, 33c.

Iron and Industrial Stocks

NEW YORK, January 18, 1911.

Another week of firm and advancing prices is to be chronicled, although transactions have been light. The range of prices on active iron and industrial stocks since Wednesday of last week and Tuesday of this week was as follows:

Allis-Chalm., com..	7⅞- 8	Pressed St., pref..	93 - 94⅜
Allis-Chalm., pref.	28	Railway Spr., com.	31 - 33
Beth. Steel, com...	29 - 30½	Republic, com....	31¼- 32⅞
Beth. Steel, pref...	59¼- 60½	Republic, pref....	93 - 94½
Can, com.	9 - 9¼	Sloss, com.	51 - 51½
Can, pref.	77⅛- 79⅜	Pipe, com.	15 - 16
Car & Fdry, com..	51 - 53½	Pipe, pref.	50 - 51
Car & Fdry, pref.	118	U. S. Steel, com...	73⅝- 78⅛
Steel Foundries...	44 - 46	U. S. Steel, pref...	117¾-118¾
Colorado Fuel.....	31¼- 33	Westinghouse Elec.	65½- 67
General Electric..	149½-152	Va. I., C. & Coke....	49⅞
Gr. N. ore cert....	57½- 58½	Am. Ship, com.	75
Int. Harv., com...	112¼-114	Chi. Pneu. Tool...	41 - 42
Int. Harv., pref...	123 -123¾	Cambria Steel.....	44 - 45
Int. Pump, com....	40 - 41½	Lake Sup. Corp...	28½- 29½
Int. Pump, pref...	84½- 85⅞	Pa. Steel, pref.	106½
Locomotive, com...	38¾- 40½	Warwick	9¾- 10¼
Locomotive, pref..	110 -110½	Crucible St., com..	12 - 12½
Nat. En. & St., com.	17	Crucible St., pref..	74 - 76
Pressed St., com..	30½- 32½	Harb.-W. Ref., com.	33½- 34

Dividends.—The American Steel Foundries has declared the regular quarterly dividend of 1¼ per cent., payable February 15.

Notes on Prices

Rope.—The demand continues along moderate lines, being commensurate with the requirements of the trade. Manufacturers are looking forward to a larger general demand for cordage by the middle of February, while others are expecting it earlier. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for smaller sizes: Pure Manila of the highest grade, 8¾c. to 9¼c. per pound; second grade Manila, 7¾c. to 8¼c. per pound; hardware grade, 7¼c. to 7¾c. per pound; pure sisal of the highest grade, 6¾c. per pound; second grade, 6¼c. per pound; jute rope, ¼-in. and up, No. 1, 6c. to 6¼c. per pound; No. 2, 5½c. to 6c. per pound.

Linseed Oil.—A reduction in the estimates of the Argentine flaxseed crop resulted in the world's seed markets advancing beyond the former basis of oil prices, and an increase of 1 cent. per gallon in the price of raw oil followed. The following quotations represent New York prices in five-barrel lots or more:

	Cents.
State, raw	94
City, raw	94

Linseed, in lots less than 5 bbl., 1 cent advance per gallon.
Boiled oil, 1 cent advance per gallon.

Spirits Turpentine.—The market has advanced at this point in sympathy with higher prices at Savannah, where consumers are paying a higher price owing to the shortage of stocks and light receipts. New York quotations in five-barrel lots are as follows:

	Cents.
In oil barrels	85½
In machine barrels	86

Less than 5-bbl. lots, ½ cent advance per gallon.

The Machinery Markets

Inquiries for machinery are coming in more freely in a number of machinery markets. A good single tool business is being done in New York, where automobile manufacturers are buying for replacements. Export business is excellent in that market, as well as in New England, where there are also indications that the settlement of the railroad rate question will result in some good railroad buying. Machine tool makers in Philadelphia report a better demand. Some good purchasing is expected from the electric railroads in the Pittsburgh market. Reports from Cleveland indicate an improvement in the automobile trade, and business is steadily improving in Cincinnati. The Kansas City & Southern Railroad is reported to have closed an order in St. Louis for $75,000 worth of tools, the bulk of the business being placed with a New York machinery firm. The railroads are buying quietly in Chicago, and the International Harvester Company has purchased about $80,000 worth of tools in that market. Railroad business is better in the Farther Central West. On the North Pacific Coast business in the metal working industries is reported to be in a flourishing condition and there is a big demand for power equipment.

New York

NEW YORK, January 18, 1911.

Inquiries are coming out in better volume in the New York market and most of them are of a nature indicating that they will result in buying in the near future. There is one small list out which is the forerunner of a larger inquiry. Some good sales were made by local dealers during the week to automobile manufacturers, and three railroads placed orders for single tools to be installed in the place of equipment that is antiquated. The demand in this market covers a general line of machinery and business is pretty well scattered. Foundrymen who cater to the machinery trade are doing a better business and the market has taken on an encouraging tone all round. The call for second-hand equipment continues excellent and good prices are being obtained for used machines.

The Delaware & Hudson Railroad Company has applied to the Public Service Commission of New York for permission to issue $7,000,000 worth of bonds, part of which will be used for the erection of new car shops at Watervliet, N. Y. The buildings there will include a locomotive repair shop, 275 x 300 ft.; a blacksmith shop, 100 x 300 ft.; boiler and tank shop, woodworking shop, car repair shop and a testing laboratory. The company also proposes to build a large cold storage plant and round house at Carbondale and a coal transfer plant at Glenville.

The Simms Magneto Company, 1780 Broadway, New York, has issued a list covering part of the mechanical requirements for its plant at Watsessing, N. J. The factory, construction work on which is well under way, is to be 150 x 300 ft. in size. It is understood that the company proposes to spend about $30,000 and the list now before the trade calls for expenditures amounting to perhaps $5000. Bids on the remainder of the machinery requirements will be asked in a few days.

The Wright Piano Company, 485-489 Greenwich street, New York, is having plans prepared by William A. Tilton, 76 Montgomery street, Jersey City, for a five-story factory building, 75 x 90 ft., to be erected at Johnson and Halliday streets, Jersey City. Charles W. Wright is president of the piano company. None of the necessary machinery equipment has as yet been purchased.

The plant of the New York Motor Boat Company at City, Island, N. Y., was destroyed by fire January 16. The company occupied a large building and all of its manufacturing equipment, together with 20 complete motor boats, was destroyed.

The New York Central Railroad Company has completed plans for the construction of a plate girder bridge 800 ft. in length over the Oswego River at Oswego, N. Y., the estimated cost of which is $125,000.

The Geer Hydroelectric Company, Albia, N. Y., has awarded contract to Sutherland & Kelly, Troy, N. Y., for construction of a 41-in. steel flume to convey water from Smart Pond to a power house on Burden Pond, to provide power for operating mills in Albia.

The construction of a garbage disposal plant is under consideration by the Board of Village Trustees, Lestershire, N. Y., and bids will soon be asked for.

The Thurstone Moving Picture Machine Company, Jamestown, N. Y., has been incorporated to manufacture moving picture apparatus and supplies. The incorporators are C. A. Johnson, L. L. Thurstone and A. Venman, all of Jamestown. The capital stock is $50,000.

The Marcellus & Otisco Lake Railway Company, Jno. Stewart, manager, will receive bids February 1 for the construction of a three-story concrete factory and power building, 100 x 250 ft., which it will erect at Syracuse, N. Y. About $10,000 worth of machinery and equipment will be installed.

The Greyhound Motor Company has been incorporated at Buffalo, N. Y., with a capital stock of $50,000, to manufacture motor vehicles, engines, meters, &c. W. C. Chadeayne, G. A. Getter and F. G. Baker are the incorporators. The company has established works and offices at 1443 Niagara street, in the Ross Mfg. Company's building.

Chicago

CHICAGO, ILL., January 17, 1911.

The Chicago machinery market shows a little improvement the past week, although the activity is not yet broad enough to keep all the dealers busy. There is quite a notable improvement in miscellaneous inquiry and a fair amount of this class of business is being done. There has also been some railroad buying of a quiet character, but not a very large amount. Altogether the trade shows improvement over December, but there is still a good deal of hesitation among buyers and a broad market is not expected until difficulties in the railroad and financial world are cleared up.

The Kansas City Southern is closing this week on a list of tools for new shops at Shreveport, La.

The Kansas City Terminal is in the market for a small list of tools on which the inquiries seem to have been scattered, as dealers have the opportunity to bid only on inquiries which come back to them on lines which they control.

The Big Four Railroad has bought two boring mills and a number of other tools for its shops at Beach Grove, Ind.

The International Harvester Company, Chicago, has made purchases of machine tools amounting to about $80,000 for shops at Milwaukee, Wis.; Springfield, Ohio, and other plants of this company. The inquiries of this company are usually sent direct to the manufacturers, but a good share of the business was taken by Chicago dealers. Included in the purchases were 15 or 20 upright drills, five radial drills and a number of lathes.

The Marcus Bridge & Iron Works, Peoria, Ill., has been incorporated with $50,000 capital stock to manufacture and deal in structural and ornamental iron and steel work. The incorporators are James V. Marcus, John J. Marcus and Katherine Marcus.

The Great Lakes Mfg. Company, North Chicago, Ill., suffered a loss by fire on the night of January 4, estimated at about $15,000. The company manufactures hardware specialties and will rebuild its plant at once.

The Johnson-Bevington Company, Chicago, has been incorporated with $10,000 capital stock to deal in machinery, tools and supplies. The incorporators are M. A. Johnson, B. L. Bevington and F. B. Macomber.

The Bentley-Snyder Company, North Aurora, Ill., has been incorporated with $75,000 capital stock to manufacture and deal in metals, electricity and electric furnace products. The incorporators are Wilton Bentley, Frederick T. Snyder and James V. Cunningham.

The Farrell, Kemp & Gushe Company, Joliet, Ill., has been incorporated with $12,000 capital stock to do general sheet metal work, furnace heating and hardware business. The incorporators are Clayton S. Farrell, William B. Kemp and Henry G. Gushe.

The Velie Engineering Company, Moline, Ill., has been granted a license to incorporate with $200,000 capital stock. The company will operate a new factory recently erected at a cost of $160,000. Electric motors, engines and automobiles will be manufactured.

The plant of the Alton Brick Company, Alton, Ill., was destroyed by fire January 7. There were six buildings,

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some of which were equipped with expensive machinery. The loss exceeds $100,000.

The Ehman Mantel & Door Works, Decatur, Ill., including $75,000 worth of new machinery just installed, was burned January 8. The loss is estimated at $200,000.

The Earlville Electric Light & Ice Company, Earlville, Ill., has been incorporated, with a capital stock of $25,000. The incorporators are John A. Dupee, C. A. Frank, A. C. Sadler and others. The company will engage in the manufacture of electricity, gas and steam heat and ice.

The Illinois Shale Tile Company, Coal City, Ill., has been incorporated, with a capital stock of $75,000. The incorporators are D. A. Haeger, John K. Newhall and John M. Raymond. The company will engage in the manufacture of brick, tile and other clay products. Construction will begin at once.

The H. V. Finkelstein Machinery & Iron Company, Peoria, Ill., has been incorporated. The capital stock is $50,000. The incorporators are H. V. Finkelstein, I. R. Meyers and Joseph A. Weil.

The plant of the Joliet Wheel Mfg. Company, Joliet, Ill., was burned January 13.

Philadelphia

PHILADELPHIA, PA., January 17, 1911.

Little has developed during the week to stimulate the market for machinery or general equipment. In many cases a better business has been done than during the corresponding period last month. Buying during the week has been confined to single tools or small lots, for the most part required for prompt delivery. Inquiries of any size are still very scarce, little coming from the railroads or industrial establishments; while some of the latter have taken on considerably more business, particularly locomotive and car builders, present equipment will in nearly every case more than take care of the work in hand. Manufacturers of machine tools, with whom new business was very quiet during December, report a trifle better demand, although in practically all lines purchases have been very irregular. Engine builders are fairly active, and while there is a moderate amount of new business pending, orders close slowly. A moderate business continues to be transacted in special tools. Makers of pulleys, hangers and general supplies report a decided improvement in the demand since the first of the year.

Steel casting makers have been taking a shade more business, but the demand for gray iron castings for machinery and tools continues quiet.

The Lackawanna Cold Storage Company, Scranton, Pa., has taken bids, through Edward Langley, architect, Connell Building, that city, for a seven-story brick and steel fireproof cold storage plant. Bids for the construction of the building were due January 7.

The Cunningham Piano Company contemplates the erection of a five-story brick and concrete addition to its manufacturing plant at Fiftieth street and Parkside avenue. Plans are being prepared by J. J. Hill, architect.

The Standard Pressed Steel Company notes quite an improvement in the demand for pressed steel shaft hangers and similar equipment. The demand from New England and the West shows the most consistent gain. An increased number of orders have been taken for export, several large ones coming from Australia, India, England and Canada. So far this month local orders taken exceed the volume of those received during the entire month of January, 1909. The company has completed improvements to its plant under way last fall and is running all departments full capacity, with a marked increase in production.

Ballinger & Perrot, architects and engineers, received bids for the erection of a brick and concrete garage, four stories, about 105 x 120 ft., for Douredoure Brothers, on January 17.

An application will be made for a charter under the laws of Pennsylvania on January 26 for the Delaware River Railway Equipment Company, Chester, Pa., to engage in the manufacture and sale of railroad supplies. W. I. Hibbs, Chester, Pa., is the solicitor.

Bids are being taken for the erection of a three-story warehouse, 40 x 115 ft., at 2107-2109 Vine street, Philadelphia, to replace that formerly occupied by the Haynes-Thompson Company, plumbers' supplies, which was recently destroyed by fire. William Anderson, 108 South Twentieth street, is the owner.

D. T. Homan, vice-president of the Bridgeport Safety Emery Wheel Company, Bridgeport, Conn., and sales representative in the Pennsylvania territory, stated that, while business was dull during December, a decided improvement since the first of the year is to be noted, a number of pending contracts having been closed, including one for four electric driven floor grinders for the new Easton, Pa., plant of the Treadwell Engineering Company. Orders have also been taken for a No. 7 floor grinder for the Hendrick Mfg. Company, Carbondale, Pa.; 15 No. Q buffing lathes for the United States Aluminum Company, New Kensington, Pa.; one No. 7 floor grinder for the American Steel Foundries, Alliance, Ohio, and a 100-in. automatic knife grinder for the Diamond Rubber Company, Akron, Ohio.

The Newton Machine Tool Works, Inc., reviewing the past year's business, states that during the first four months business averaged far in excess of normal; there was a steady decrease during the second half, except in November, when a gain was reported, followed by a sharp falling off in December. On an average, however, shipments during 1910 were 10 per cent. better than the best previous year and the volume of business was double that in 1909. Many improvements were made to the plant during 1910, greatly facilitating productive capacity. A complete rearrangement of machine tools in the plant is further contemplated, as well as purchases of additional equipment, which, together with a proposed modernizing plan, will increase the plant capacity 50 per cent. Machines shipped during the past year were about equally divided between bridge, locomotive, structural and general machine shop and steel foundries, covering horizontal chord boring machines, vertical eye bar boring machines, cold saw cutting-off machines, horizontal milling machines, boring, drilling and milling machines, slotting machines, &c. Heavy export shipments were made of cold saws for Japan, mlling machines for Australia, and portable slotting machines, boring machines and milling machines to Germany. A greater disposition to specialize in the types of machines built by this company is noted. This is specially true of cold saw cutting-off machines, which are now manufactured in certain types in lots of 25.

Cleveland

CLEVELAND, OHIO, January 17, 1911.

The local machinery market is still quiet, but the outlook is more favorable, as both dealers and builders of machine tools report some improvement in the volume of inquiries since the first of the year. Sales by dealers during the week were limited largely to small lots of medium sized and small tools and single tools. Most of this business comes from small concerns that are opening new shops. A number of inquiries that have been pending for several weeks have not yet resulted in the placing of orders, but business is expected to develop from some of these before the end of the month. Crane builders report an improvement in inquiries. Manufacturers of sheet metal products are fairly busy, reporting a good volume of business in some of their departments. Reports indicate an improvement in the outlook in the automobile trade and a good year is expected. Business is somewhat quiet with makers of automobile parts, a large share of manufacturers not yet having placed orders for their requirements in these lines. The general manufacturing situation in metal working lines looks brighter than for a number of weeks and manufacturers feel that there will be a steady improvement in business.

In the foundry trade the demand is still somewhat light, but there has been an improvement in orders since the first of the year.

The Chisholm & Moore Mfg. Company, Cleveland, which recently acquired a portion of the plant formerly occupied by the Garry Iron & Steel Company, adjoining its own plant, will shortly fit it up for an addition to its malleable iron foundry, increasing the capacity of that department 66 per cent. The company will install modern sand blast equipment, for which it is now in the market. One new 15-ton malleable furnace will be built. The company reports that it is well filled with work in its malleable castings department and that it is getting a good volume of orders for hoists.

The plant of the Canton Mfg. Company, Canton, Ohio, has changed hands, the ownership having been acquired by the Multiplex Filing Device Company. The company is now being reorganized and its capital stock will be increased to $200,000. The name of the Canton Mfg. Company will be retained. The new company will make a specialty of architectural sheet metal products. It will also make metal filing cabinets and some of the lines formerly made by the Canton Mfg. Company, including metal ceilings, skylights, ventilators, cornices and fireproof doors and windows. A number of changes are being made to the plant. A machine shop has been put in and a woodworking plant will be installed, for which some woodworking machinery will be purchased.

The Union Metal Mfg. Company, Canton, Ohio, has completed plans for the erection of a new plant, one-story, 48 x 156 ft., of tile construction, and an office building, 30 x 37 ft.

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The old plant will be used as a finishing and shipping department. Some new equipment will be purchased, including a shaper, lathe and press and small sheet metal working tools. The company makes metal columns and ornamental lamp standards for streets and building entrances.

The Berger Mfg. Company, Canton, Ohio, reports a very good demand for metal furniture and prospects for a good year's business in all of its departments. While this company has no plant additions under consideration for the present year some shears, brakes and other new equipment will probably be added.

An ice making plant will be built in Ashland, Ohio, early this season, with a daily capacity of 15 tons. A. R. Eyster of Loudonville, Ohio, is one of the men interested in the project.

The Pulverizing Plow Company, Wellington, Ohio, has been incorporated with a capital stock of $4000 to manufacture plows. Among the incorporators are Freeborn Bedee, E. F. Garrett and John W. Wright.

The Canton Art Metal Company, Canton, Ohio, expects shortly to enlarge its plant to provide more room for its metal furniture department. The company reports a large amount of work on hand in this department, this including several large contracts for complete equipment for new court houses.

Sealed proposals will be received by the Secretary of the Director of Public Safety, Cleveland, January 26, for a rectangular steam pressure disinfector and sterilizer for the municipal tuberculosis sanitarium.

The Bottomley Machine Company, Alliance, Ohio, will build a new plant 36 x 60 ft. as soon as a site is secured.

The plant of the Snyder Mfg. Company, Wapakoneta, Ohio, maker of furniture and mill work, was destroyed by fire January 5, causing a loss of $25,000. The engine, boilers and considerable wood working machinery were rendered worthless. It is expected that steps will be taken at once to rebuild the plant.

The Kelly Reamer Company, Cleveland, expects to shortly add to its machine tool equipment, the present capacity of its plant being inadequate to meet the demands of its growing volume of business.

The Delphos Mfg. Company, Delphos, Ohio, is planning the establishment of a branch galvanizing plant, having under consideration a site in Knox, Ind., and one or two other points near Chicago.

The Buckeye Ice & Coal Company, Findley, Ohio, is contemplating the erection of an artificial ice plant.

The Bradner Machine & Foundry plant, Bradner, Ohio, has been purchased by W. C. Speaker, who, it is stated, will organize a company for the manufacture of a gas generator for use particularly in the country districts and by farmers.

The Kenton Gas & Electric Company, Kenton, Ohio, has applied for an extension to its franchise, as it contemplates making extensive improvements to its plant.

Cincinnati

CINCINNATI, OHIO, January 17, 1911.

Inquiries for machine tools are coming in freely, but actual business booked is rather light, although it shows some improvement over the first week in January. The large inquiry, which is principally from the general trade, shows that many tools are needed all over the country. Local banks are reported to be loosening up on loans, and if this move is general some improvement in the business situation may be hoped for soon.

Machinery dealers are having practically the same experience as the manufacturers and report many requests received for prices on different tools, but few orders developing. However, a few milling machine and smaller sized lathes have been shipped lately.

Second-hand dealers do not note any marked improvement, although some sales of woodworking machinery were recently reported. The situation with the foundries is unchanged.

The Cincinnati Branch, National Metal Trades Association will hold its regular annual meeting March 2. Officers for the ensuing year will be elected and arrangements consummated for attending the national convention that will be held in New York in April.

Robert Wuest, commissioner of the National Metal Trades Association, and H. C. Hunter and J. M. Manley, respective secretaries of the New York and Cincinnati branches, left Cincinnati January 16 for a lecture tour through the central West. The purpose of the trip is to stimulate interest in the work of the National Association, especially that part of it having in view the proper development of industrial education along the lines followed by the Cincinnati Continuation School.

The Paul Stewart Company is a new incorporation in Cincinnati, with an authorized capital stock of $50,000, to deal in electrical and power apparatus. The company has acquired a five acre site at Redbank, a Cincinnati suburb, on which will be erected warehouses and shop buildings. Work has already commenced on one steel and concrete structure, which will be 50 x 100 ft. Paul Stewart, formerly with the John A. Stewart Electrical Company, is president of the new company; George Gano, vice-president and treasurer, and Colter Rule, secretary.

The Lexington Machine Works, Lexington, Ky., is a new incorporation with $12,000 capital stock. The incorporators are E. B. Drake, Y. Alexander, S. E. Drake and J. P. Glenn.

Schumacher & Boye, Cincinnati machine tool builders, report a good volume of inquiries coming in and also a fairly satisfactory number of orders booked recently. Their plant is running on full time.

The National Rolling Mill Company, Mansfield, Ohio, has increased its capital stock from $100,000 to $150,000.

On January 10 fire practically destroyed the Chamber of Commerce Building, Cincinnati. Tentative plans are already under way for erecting a large steel building on the old site.

A fire destroyed one of the car barns of the Cincinnati Traction Company, Brighton station, January 12. The loss is estimated at $20,000 and rebuilding plans are reported to be already under way.

The Saunders Faucet Company has been incorporated at Elyria, Ohio, with $10,000 capital stock to manufacture faucets and valves. The incorporators are H. W. Ingersoll, H. A. Dyhman, F. Beebe, Chas. B. Tucker and L. J. George.

The Fairmont & Clarksburg Traction Company, Fairmont, W. Va., has commenced work on a one-story car repair shop, 80 x 80 ft., which will be of steel and brick construction.

The Toledo Electric Welder Company, Cincinnati, has recently received a large number of domestic orders for its welding machines, and also reports some unsolicited export business.

The Roberta Coal Company, Ashland, Ky., to mine coal and manufacture coke, was recently incorporated under West Virginia laws, with $100,000 capital stock. The incorporators are John F. Hager, L. S. Wilson, B. E. Whitman, S. S. Willis and W. E. Eldridge, all of Ashland.

The Clark Gear Company, Elkins, W. Va., is a new incorporation with a nominal capital stock of $3000 to manufacture reverse gears. P. E. Clark, R. Chaffey, Mary Clark and L. C. Dyer, all of Hambleton, W. Va., are named as incorporators.

It is reported that the Toledo Biscuit Company, Toledo, Ohio, will build a five-story reinforced concrete factory to take the place of its structure recently destroyed by fire.

The Ford Plate Glass Company, Rossford, Ohio, has plans completed for several new buildings.

The Limbert Mfg. Company is a new incorporation at Springfield, Ohio, with $20,000 capital stock. The incorporators are O. C. Clark, C. L. Steele and S. H. Limbert. The company will manufacture a new flue cleaner.

The Cincinnati Wood Preserving Company, Cincinnati, has been incorporated with $20,000 capital stock. The company owns a plant in the western part of the city, to which some extensive additions are planned for next summer. Its officers are: H. H. Beers, president; F. W. Cherrington, general manager, and J. M. Stirnkorb, secretary and treasurer.

Indianapolis

INDIANAPOLIS, IND., January 17, 1911.

The Hardegan Axle Company, Indianapolis, has been incorporated, with $10,000 capital stock, to manufacture automobile parts and accessories. The directors are E. C. Hardegan, Elmer W. Stout and M. H. Miller.

The purchasers of the Parry Auto Company, Indianapolis, which went into the hands of a receiver, have reorganized as the Motor Car Mfg. Company, with $75,000 capital stock. The directors are William C. Teasdale, Jr., formerly vice-president of the Parry Company; Fred C. Dorn, Wayne K. Bromley, G. O. Simon and Frank H. Teagle. The purchase price of the Parry Auto Company was $50,000. G. O. Simon, who has been connected with an automobile company in Dayton, Ohio, will be the manager. About 1000 cars will be made this season. The company will give its first attention, however, to filling orders for parts that have accumulated during the receivership.

Hentherington & Berner, iron manufacturers, Indianapolis, have increased their capital stock from $27,000 to $81,000.

W. W. Prigg has been appointed receiver for the Newcastle Automatic Wrench Company, Newcastle, Ind., on petition of one of the dissatisfied stockholders.

The Evansville Sand & Gravel Company, Evansville, Ind., will expend $50,000 in building a dock of concrete, 500

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ft. long, on the Ohio River front. It will be used largely for transferring Pittsburgh coal from boat to rail.

The La Porte Meter Company, La Porte, Ind., has been incorporated, with $150,000 capital stock, to take over the unincorporated business of the La Porte Gas Meter Company. No change in management or improvements are contemplated.

The Peru Electric Company, Peru, Ind., incorporated with $100,000 capital stock, has acquired the property at receiver's sale of the Peru Electric Mfg. Company. Extensive improvements have been made to the plant and additional machinery installed.

The Electric Light & Power Company of Lebanon, Ind., has increased its capital stock $50,000.

The Advance Auto & Machine Company, Evansville, Ind., has been incorporated, with $10,000 capital stock, to manufacture automobiles. The directors are H. Kollker, J. W. Wheeler and J. Diers.

The Seymour Public Service Company, Seymour, Ind., has enlarged its purposes to include the right to deal in gas and electrical appliances. The capital stock has been increased from $100,000 to $250,000.

The American Seeding Company is adding another factory building to its plant at Richmond, Ind. A large warehouse was recently completed and an office building may be erected in the spring. Over 1000 men are employed and many departments are working overtime.

Since the opening of the new year the Vincennes Bridge Company, Vincennes, Ind., has received contracts to the amount of $80,000. In 1910 the company secured 1200 contracts, all that it was able to take care of. It is considering the advisability of doubling its capacity.

New England

BOSTON, MASS., January 17, 1911.

The machinery builders report an increasing foreign demand, and in a few cases works are running normal because of orders received for export. Dealers find the situation unchanged. In spite of the immediate dullness of trade, manufacturers are making vigorous efforts to perfect their forces of skilled workmen. The local press of the New England centers contain more than a few requests for good men, specialists seeming to be in best demand. The release of high class mechanics by the automobile builders of the Middle West has been taken advantage of in this section, where the scarcity of good labor has been keenly felt. Apparently, the machine tool builders are preparing themselves for much different conditions of business, which seem to them to be not very distant.

The Trumbull Electric Mfg. Company, Plainville, Conn., manufacturer of electrical supplies, has completed plans for large additions to its factory. The main buildings will be four stories, one 40 x 106 ft., the other 63 x 72 ft., an elevator tower 10 x 25 ft., and a vault 19 x 23 ft. A new boiler house will be 43 x 44 ft., and an enginehouse room 25 x 40 ft. Skylights, sprinkler system, two freight elevators and an electric system will be installed. The power equipment has been contracted for.

The Arcade Malleable Iron Foundry, Worcester, Mass., manufacturer of malleable iron castings, will build an annealing room 50 x 100 ft. The business has grown rapidly, until additional facilities have become imperative.

The International Radiator Company, New Haven, Conn., with works at 453 Chapel street, has incorporated with a Connecticut charter, to manufacture automobile radiators and do a general repair business. The incorporators are Salvatore Gargiulo, Louis Scoppa, Oreste Balzano, Stefano Campagnano, Achille Capecelatro, Girolamo Arcucci, Giulio Cioffi, Luigi Esposoto, Louis Rubano and Peter Balzano, all of New Haven. The company states that it is not at present in the market for equipment.

The sporting goods factory of Draper & Maynard, Plymouth, N. H., was burned January 16, with a loss of $125,000.

The Frisbie-Heft Motor Company, Middletown, Conn., has changed its name to the Frisbie Motor Company.

The F. E. Reed Company, Worcester, Mass., is putting on the market a new line of heavy duty, double back geared engine lathes of which the 18-in., 20-in., 22-in. and 24-in. sizes are ready and the 27-in. and 30-in. machines will follow later. They are designed especially for railroad shops and other plants requiring heavy work.

The National Printing Machinery Company, Inc., 167 Hapgood street, Athol, Mass., is in the market for a planer 36 x 54 in. by 10 ft., with two heads, and a Brown & Sharpe, or other make as good, automatic gear cutter for bevel and spur gears up to 16 in. in diameter. In explanation of the planer requirement the company states that the unusual width is demanded by the work, but that the machine need be no heavier than the standard 18 x 18 in. by 10-ft. type. Second hand tools will be considered.

The Boston & Maine Railroad officially announces that the great repair shops for which $2,500,000 has been appropriated will not be located at East Somerville, Mass., where the running repair shop is nearing completion. The decision is to locate the larger works somewhat farther from Boston on the system, and a site near Lowell has been considered. No decision as to location has been made, however.

A power project of unusual magnitude is proposed for the Moosehead Lake waters, by a syndicate headed by Chase & Harriman, Inc., Boston, who promoted the Connecticut River Power Company, which is now supplying power in Central Massachusetts. The Maine plans call for the development of about 100,000-hp. which, it is stated, will be distributed within the limits of that state.

The West Haven Mfg. Company, New Haven, Conn., manufacturer of hack saw blades and machines has increased its capital stock from $50,000 to $100,000.

Derby & Hall, Bellows Falls, Vt., is erecting an addition which will house machinery for the manufacture of scythe snaths or handles.

The stove manufacturing business of Oscar G. Thomas, Taunton, Mass., has been incorporated as the Oscar G. Thomas Company, with capital stock of $50,000. The incorporators are Oscar G. Thomas, Howard W. Thomas and Richard W. Whitmarsh.

Pittsburgh

PITTSBURGH, PA., January 17, 1911.

The Southern Cambria Railway Company, Johnstown, Pa., which was originally intended to be built as far as Ebensburg, is to be completed to that point this year, and the Johnstown Chamber of Commerce is reported to be giving active aid to the project.

In a letter from Morgantown, W. Va., it is stated that plans for a new electric generating plant will soon be put in execution at that place by the Morgantown & Dunkard Valley Railroad Company. J. A. Morgan, the general manager, is also chief engineer and purchasing agent. An extension of the company's system is under consideration.

The Pennsylvania Power Company, which supplies current for motor drive and lighting service in Ellwood City, Wampum, Zelienpole and West Pittsburgh, from a plant at Ellwood City, equipped with Allis-Chalmers steam turbine units, will add to its system a hydroelectric development, having contracted with the Westinghouse Electric & Mfg. Company for two alternating current generators of 600 kw. each, and with the S. Morgan Smith Company for hydraulic turbines of corresponding capacity for operating them. Considerable auxiliary apparatus is also being ordered and more will be required later.

The Carbondale Machine Company, Carbondale, Pa., will install an exhaust steam absorption plant for the Geo. G. Fetter Lighting & Heating Company, Louisville, Ky., to be used in connection with a refrigeration system.

The Carter Iron Company contemplates the construction of a hydraulic power plant in the vicinity of its furnaces at Ivanhoe, Va., to furnish electric current for operating machinery. No definite plans have, however, been approved.

Plans are now stated to be practically complete for the five new buildings to be added to the manufacturing plant of the Westinghouse Electric & Mfg. Company, Pittsburgh, which will be of brick construction, with saw-tooth roofs.

Extensive development work, for which power, timber cutting and other machinery will be needed, is to be entered upon in the spring by the Guyan Lumber Company, recently organized, with $200,000 capital stock, at Herndon, W. Va.

Additional power equipment, including a battery of boilers, is to be installed at Bluefield, W. Va., by the Norfolk & Western Railway. The present plant building will be enlarged for the purpose.

Advices from Steelton, Pa., are to the effect that the Steelton Light, Heat & Power Company, which now buys current from the York Haven Water & Power Company, is about to erect its own electric generating plant. The present system takes about 1500 kw.

Manufacturers here will bid on the electrical equipment of a large new textile mill, calling for about 2000 hp. in motors, which Lockwood, Greene & Co., Boston, are designing for construction at Greenville, S. C.

It is stated here, without direct confirmation, that a transfer of real estate recently made in this vicinity is for the account of the Linde Air Products Company of Buffalo, N. Y., to be used as the site of a new manufacturing plant.

The Blairsville Foundry Company, Blairsville, Pa., has been incorporated for $10,000.

It is reported from McKeesport, Pa., that the Home Light Company has been organized there with the object of con-

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structing an electric plant for public service. Simon F. Loeb, Henry Firestone and Jacob Roth are named as the incorporators.

The Martinsburg Power Company, Martinsburg, W. Va., is arranging for the enlargement of its power plant.

Among contracts recently taken by the Erie City Iron Works, Erie, Pa., for pumping machinery, is one covering two motor driven centrifugal units to be installed in the plant of the Keithsburg Drainage District, Keithsburg, Ill., which has been an object of much interest in engineering circles as a type of many similar projects to be undertaken in the low sections lying along the rivers of the Middle West.

The Union Iron Works, Erie, Pa., is preparing to make an interesting installation in a large public building at Los Angeles, Cal., consisting of marine boilers equipped with oil burning furnaces of the Morrison corrugated type and having the so-called Cyclone fronts for spraying the fuel.

H. J. Koontz, manufacturers' agent and dealer in new and second-hand machinery and equipment, has moved his office to 1102 Farmers' Bank Building, Pittsburgh.

St. Louis

ST. LOUIS, MO., January 16, 1911.

A good deal of machinery is being figured on, but not many orders are being placed. A few rather heavy tools have been inquired for, but the dull first half of January is not worrying any one, since this is simply repeating history, which shows that people do not get down to machinery purchases until some little time after the turn of the year.

The Kansas City Southern Railway is reported to have just closed an order for about $75,000 worth of tools, of which the bulk went to a large New York house.

The city is preparing to let contracts for the wrecking of seven solid blocks of buildings to make way for the west side approach for the new municipal bridge. This has resulted in a number of manufacturing concerns having to arrange for new plants.

The railroads are gradually encroaching on the machinery district by buying land for freight house purposes. The most recent purchase is the block on which is located the Fulton Iron Works, by the Burlington.

A new company, to be known as the National Oil Cloth Company of St. Louis, is being organized by leading St. Louis men. It will be incorporated soon, with a capital stock of $75,000. The factory will be located on the M. A. Seed Dry Plate Company's property on the Wabash Railroad. William Nesbit, who will be the president of the new company, states that machinery for the plant will be ordered at once. The building of the Seed Dry Plate Company, which is to remove to Rochester, N. Y., has been leased, with an option for its purchase.

The Bates County Gas Company, Carthage, Mo., has been incorporated. The capital stock is $50,000. The incorporators are T. W. Connelly, J. S. Connelly and J. C. Gibson.

The Vesuvius Mining Company, Webb City, Mo., will erect a 300-ton mill which will cost from $10,000 to $15,000.

Detroit

DETROIT, MICH., January 17, 1911.

One of the most interesting of recent developments in the machinery trade is the announcement that the National Boat & Engine Company, organized at Muskegon, Mich., last fall, has formally taken over the plants of the Racine Boat & Mfg. Company of that place, the Truscott Boat Mfg. Company, St. Joseph, Mich., and the Pioneer Boat & Pattern Company, Bay City, Mich., as well as the Pope Boat Company, Fond du Lac, Wis.; Outing Boat Company, Ashland, Wis.; Inland Lakes Boat Company, Lake Geneva, Wis.; Shell Lake Boat Company, Shell Lake, Wis.; Western Launch & Engine Works, Michigan City, Ind., and others comprised in the combine which are located at a distance. The aggregate buying of equipment and supplies for the account of these various concerns each year has been very considerable. The headquarters of the company, having been established at Chicago, there will probably be corresponding changes in the basis of purchasing.

The Chalmers Detroit Motor Company, Detroit, is arranging for the construction of a new boiler plant as a part of its plan for a more comprehensive power system for the works.

The city of Flint, Mich., has retained a consulting engineer and will proceed at once with the execution of the plans recently outlined for a new pumping station, filtration plant and other water works improvements.

The manufacturing facilities of the Grand Rapids Book Case Company, Grand Rapids, Mich., are to be enlarged, an increase in the company's capital having recently been provided in order to keep pace with the growth of the business.

Harry E. Perrault and Wm. J. Brand have organized the Simplex Differential Clutch Company and incorporated it for $25,000, to operate a plant in Detroit. The mechanism is for use on automobiles.

It is reported from Lansing, Mich., that the Kerff Company of that place will build a machine shop and plating establishment. Further details are lacking.

The Hupp Motor Car Company, Detroit, has doubled its capital stock.

John Beyster, Detroit, is having plans drawn for a two-story plant, 50 x 200 ft., to be used in the manufacture of motor cars and parts. Spier, Rohns & Gehrke, Detroit, will have charge of the construction.

A. F. Bartlett & Co., Saginaw, Mich., have kept their foundry and machine shops busy during the past year on orders from all parts of the country, and the outlook for the future is good. Lath mill machinery is their specialty.

The Eastern Michigan Power Company will build a dam across the Au Sable River, near Saginaw, Mich., and install hydraulic turbines, direct connected to alternating current generators, for the purpose of furnishing commercial power to woodworking plants and other industrial establishments in Saginaw and Bay City and vicinity.

The Electric Welding Company, Detroit, will provide enlarged shop facilities, probably by the erection of a new plant.

Plans have been completed and work will start early in the spring on the new four-story factory building of the Continental Motor Mfg. Company, Muskegon, Mich., the designing of which has been in the hands of Robinson & Campau, Grand Rapids, Mich. Communications are best addressed in their care.

The new Lansing & Grand Lodge Railroad, Lansing, Mich., construction of which will begin in the spring, has decided not to erect its own power plant.

Manufacturers and dealers in this district will figure on the equipment of a new plant for the H. W. Clark Company at Mattoon, Ill., for the manufacture of various appliances used in water distributing systems, including meter boxes. Brassworking tools are reported to be among the requirements.

A two-story and basement factory, 125 x 130 ft., is to be built at Hastings, Mich., by the Barber Chair Company. The equipment will comprise power and woodworking machinery.

The Monroe Body Company, Detroit, which was organized some time ago by R. F. Monroe, Pontiac, Mich., to take over the Detroit and Pontiac plants of the Yeomans Body & Box Company, is planning to enlarge the Detroit factory and provide facilities for the production of metal bodies for motor cars. J. M. Parker, Pontiac, is secretary of the company, and Charles R. Talbot of the National Bank of Commerce, in Detroit, is treasurer, Mr. Monroe being the president and general manager.

From East Tawas, Mich., it is reported that Chief Engineer L. O. Pettyes of the Detroit & Mackinac Railway will start work on the line to the new industrial town of Calcite, Mich., thereby opening up an important field to manufacturing enterprises.

Lowrie & Robinson, River Rouge, Mich., contemplate making a large addition to their plant.

Fuller Clafflin of Lansing, Mich., is the principal incorporator of a new company, known as the Steel Bar Flanging Company, which it is reported will establish a plant in Detroit. The capital stock is $25,000, with $13,000 paid in.

Fritz Beitner, Traverse City, Mich., has organized a company which will remodel the old Beitner saw mill at Beitner Siding, near that place, install new machinery and start operations in the spring.

The Paige-Detroit Motor Car Company of this city has increased its capital stock from $100,000 to $250,000.

The Detroit plant of the Chicago Pneumatic Tool Company is working day and night, with orders enough on the books, it is stated, to keep it running for some time ahead, while new business continues to come in freely. The increased facilities about to be provided here, including a shop addition, 92 x 145 ft., will enable a considerably larger output to be maintained.

The Northern Construction Company, Detroit, is reported to have recently awarded contracts for the initial construction work of a hydroelectric plant of 24,000 kw. for the Georgia Power Company, which will eventually be doubled in capacity.

Plans are maturing for the new manufacturing plant to be erected by the Central Boiler & Supply Company, Grand Rapids, Mich.

The public lighting plant at Standish, Mich., operated by the Citizens' Mfg. Company, has been acquired by new interests and will be improved. Its present electrical equip-

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ment, of 125 kw., consists of Ft. Wayne generators driven from Erie engines.

The Detroit Bridge Company, Detroit, will be prepared in the near future to let contracts for the construction of a new three-story fabricating plant, 220 x 255 ft., which it is arranging to build.

The Seager Engine Works, Lansing, Mich., is proceeding with plans for the extension of its plant.

The Interchangeable Fixture Company, Grand Rapids, Mich., incorporated with $30,000 capital stock, has secured a plant, fully equipped, which it now has in operation. Some small tools and light machinery will probably be purchased at a later date.

The Lansing & Northwestern Railway will erect a substation at Owosso, Mich. The company has taken over the Owosso & Corunna electric line, which it will operate in conjunction with an interurban line which is now nearly completed, between Lansing and Owosso.

Details of the new steam power plant to be erected by the Eastern Michigan Edison Company, Rochester, Mich., near Amy, Mich., have not been completed.

The Golden Rule Hay Press Company, Kalamazoo, Mich., is negotiating for a site on which it will erect a factory in the near future.

The Leisen & Henes Brewing Company, Menominee, Mich., will rebuild in the spring its plant, which was recently destroyed by fire. About $50,000 will be expended by the company in buildings and machinery.

Milwaukee

MILWAUKEE, WIS., January 16, 1911.

Business here for the new year is opening up more slowly than had been generally anticipated. At nearly all of the larger manufacturing plants of the city and its suburbs, conditions are generally dull. There are, however, some exceptions to the rule, with the prospect that increasing activity will be visible from now on.

One line which shows up uncommonly well is the sale of refrigerating machinery, including the engines, motors and other power equipment which they usually comprise. Orders recently from the South, Southwest and foreign countries with tropical climates have been liberal.

The dairy and condensed milk industries are also beginning to play a prominent part in the demand for mechanical and electrical equipment. Beginning with the furnaces and boilers, practically all of the plants now being planned or erected are of a thoroughly modern character, with apparatus to correspond. This is a field which machinery houses will find well worth cultivating, at least in Wisconsin and northern Illinois.

The Christiansen Engineering Company, Milwaukee, manufacturer of gasoline engines, compressors, &c., has had plans drawn for a new shop building 65 x 110 ft., to be added to its plant at the Chicago, Milwaukee & St. Paul Railway crossing on Thirtieth St. The business of this company has been steadily expanding, even during the recent dull period, and increased facilities are urgently needed.

Plans for a new wood-working plant, with the most modern equipment, will be proceeded with at once by the Layton Park Woodwork Company, Milwaukee, to replace that burned.

It is reported from La Crosse, Wis., but without direct confirmation, that the new plant of the Reliance Engine & Iron Company, now of Racine, has been definitely secured for that city.

Bids will be taken by the city purchasing agent, Milwaukee, on a motor-driven crusher, conveyor, hoist, &c., for handling clinker at the municipal incineration plant on Jones Island. The engineer in charge has just prepared the necessary specifications.

A new company in which United States Senator Isaac Stephenson, of Marinette, Wis., is reported to be heavily interested, will take measures to construct a large water power plant at Chappie Rapids, to supply electric current to the Marinette & Menominee Paper Company, Marinette, Wis., and other industries in that part of the State, as well as across the river in Michigan. Definite plans for the project have not been worked out, but an engineer will probably be engaged for the purpose shortly.

Boiler capacity aggregating 500 h. p. and power machinery, including an electric generator, will be required in March or April for a milk condensing plant to be built at Elkhorn, Wis., by John Harris and others interested in the Wisconsin Butter & Cheese Company.

A crushing plant 50 x 75 ft., manufacturing building 60 x 80 ft., and an extension of the boiler house will be constructed shortly at the plant of the United States Glue Company, Carrollville, Wis. Some additional equipment will be required.

The Bloomer Electric Light & Power Company, Bloomer, Wis., which was recently incorporated for $25,000, will install a plant sufficiently large to supply industrial power as well as lighting service.

A new boiler of 100 h. p. or larger will be installed this spring in the water works plant at Sharon, Wis., where plans for enlarging the building are now being made. The Freeman type is preferred.

Thirty four-cylinder planing machines from the Berlin Machine Works, Beloit, Wis., together with 22 trim saws, two band resaws and a complete line of box-making machinery, will be included in the equipment of the immense new plant which is being built at Bogalusa, La., by the Great Southern Lumber Company. All machinery will be operated by electric motors supplied with current from an exhaust steam turbine plant previously supplied by the Allis-Chalmers Company, Milwaukee.

The Hustisford Electric Light & Power Company, recently organized at Hustisford, Wis., has been granted a franchise for public service and will install the necessary machinery.

The Board of Public Works at Escanaba, Mich., has been authorized by the City Council to have plans prepared for a municipal gas plant. A bond issue of $30,000 for its construction has been voted.

The authorities at Oconomowoc, Wis., have under consideration the installation of new boilers in the municipal power plant.

The Vilter Mfg. Company, Milwaukee, among recent orders, has taken the contract for a 22 x 58 x 38 in. compound Corliss engine, equipped with its new valve gear, and a 350-ton refrigeration plant to be installed by the P. Schoenhofen Brewing Company, Chicago, Ill.

The Wisconsin Telephone Company will construct a repair shop in Milwaukee and furnish it with very complete equipment for use in connection with the material needed in the maintenance of its system. The definite plans for this have not yet, however, been announced.

The Columbia County Light & Power Company, Wyocena, Wis., which recently purchased the electric plant of the Duck Creek Light & Power Company, equipped with hydraulic turbine, gasoline engines and alternating current generators of 75 kw, will enlarge its capacity by installing new machinery. Transformer substations are also to be erected in Pardeeville and Rio, Wis., and transmission lines run to those places. Both commercial power and lighting service will be furnished in all three cities. B. C. Keeley, manager of the old company, remains in charge of the new, but will make his headquarters in Pardeeville, Wis.

A report from Lena, Wis., is to the effect that the United States Mfg. Company will purchase a power plant equipment, including a gas producer engine unit.

The J. I. Case Threshing Machine Company, Racine, Wis., is providing more extensive facilities for the production of the boilers used with its machines. A new warehouse building, equipped with traveling crane, hoists, &c., was recently completed, and the existing storage plant remodeled for use as a machine shop until additional buildings can be erected.

The Cleveland Mining Company, Hazel Green, Wis., is arranging to equip its property with power and concentrating machinery.

The Worden-Allen Company, Milwaukee, is exhibiting some very interesting photographs showing the steel work for a covered runway and electric lumber carrier designed for the Gulf Lumber Company, Fullerton, La. This class of work is opening up a new field to fabricators and erectors of structural steel, as well as manufacturers of the conveying systems for such plants.

The City Council of New Lisbon, Wis., has voted to establish a municipal lighting plant.

Toronto

TORONTO, January 14, 1911.

The machinery business has not yet quite found its pace for the year, but operations are being resumed with briskness at many large shops, where the lull for stock taking and repairs was rather pronounced while it lasted. Reports are generally to the effect that there is no reaction in sight, and to machinery manufacturers and dealers the outlook is particularly encouraging. The expectations are that business throughout 1911 will be as good as it was throughout 1910. Some of the manufacturers express the opinion that the downward tendency in the prices of iron and steel will be beneficial to trade in articles made from those materials. The chance of keener competition from the United States as a consequence of some degree of depression there and of possible reciprocal favors to that country is referred to by some Canadian machinery manufacturers as

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one to be taken account of. But there are many large plans laid out and financially provided for which will make a market for a considerable machinery output in the present year. Contractors' outfit, mining plant, factory equipment, power works, &c., will be required for many new undertakings.

The Western dry dock, at Port Arthur, Ont., is nearly completed. The equipment and general machinery are pronounced by O. J. Fish, secretary of the American Shipbuilding Company, who visited it this week, to be as near to perfection as possible. Shipbuilding is to be carried on there as well as ship repairing.

The Canadian Coal & Coke Company has been incorporated by Dominion authority. Its capital stock is $15,000,000 and head office is at Montreal.

The Dominion Power & Transmission Company will spend $100,000 on new substations at Hamilton, Ont.

The J. B. Hicks Gas Engine Company has entered into an arrangement to establish works in Sarnia, Ont.

The rate payers of Fort Frances, Ont., approved the by-law in favor of the Shevlin-Clarke Company, which will at once begin the construction of its large mills in the town.

Listowel, Ont., will spend $5000 upon equipment of its electric light plant.

The Massey-Harris Company, Toronto and Brantford, Ont., is adding to its list of articles it manufactures steam plows and gasoline engines, both of which classes of machinery it will have on the market this year.

The Sawyer-Massey Company, Hamilton, Ont., is preparing to build a large warehouse at Regina, Saskatchewan.

The Canadian Automatic Transportation Company has secured a site for a factory in Welland, Ont.

A permit has just been taken out by the Winnipeg Electric Railway Company for the construction of a turbine power building on Mill street, Winnipeg, Man. A modern steam turbine plant of 12,000 nominal horsepower is to be installed. This can be raised to 18,000 actual horsepower, as machines guaranteed to carry 50 per cent. overload are to be put in. It is estimated that the cost of this new power plant will be at least $500,000.

The Maritime Engineering Company, Truro, N. S., is now in operation. A 60-hp. engine has just been turned out as the first product of the new works.

James A. Moore, president of the Western Steel Corporation, which is operating a plant at Irondale, Wash., has from time to time for some years back been credited by newspapers in British Columbia with great steel projects for that province. It is stated in the Vancouver *Province* of January 6 that a company of which he is said to be the head will spend about $2,000,000 upon the construction and equipment of steel works on the south side of the Fraser River, opposite Annacis Island. The location is about 5 miles from the city of New Westminster, B. C. According to the *Province*, 300 acres of land have been acquired for the purpose.

In the nine months ending with December, which are the first nine months of the current fiscal year, Canada imported 2121 motor cars from the United States, the value being $2,474,462. During the whole of the last fiscal year only 1457 motor cars were imported from the United States, the value being $1,816,164.

Premier Richard McBride of British Columbia says that in the next four years $100,000,000 will be applied to development enterprises in that province. Of this he estimates that $50,000,000 will be used in railroad construction, that $20,000,000 will be expended by the Provincial Government itself upon public works, and that $30,000,000 will be put into mining, timber and other resources by private capitalists. Large minor crops of capital applications will be planted on the soil that is thus prepared by the main exploiters.

The contract for the construction of the municipal dam and power house in Sherbrooke, Que., has been awarded to Morrow & Beatty, Peterborough, Ont.

The Industrial Commissioner of Port Arthur, Ont., is negotiating with Barr Bros. of Eugene, Ore., for the purpose of inducing them to establish a branch of their cutlery works in Port Arthur.

The City Council of Montreal has under consideration the submitting of by-laws to the rate payers to authorize the issue of 40-year debentures for $12,000,000, the money to be applied to the installation of a municipal electric lighting plant, the construction of a filtration plant, the laying and equipment of underground conduits, and the building or improving of other public works.

Several large manufacturing concerns are locating on the south bank of the Fraser River, B. C., at the point the Canadian Northern Railway is to touch. Port Mann is expected to become a great industrial center.

It is said that the Canadian railroad companies that have important construction contracts to place this year find American firms more eager than ever to undertake the work. This is accounted for by the falling off in railroad building operations in the United States.

It is announced that arrangements have been completed for the establishing at Windsor, Ont., of a Canadian branch of the Maloney Electric Company, St. Louis, Mo. The company manufactures electric transformers and is said to have already $500,000 of Canadian orders on its books.

The Canadian Steel Foundries, Ltd., has been federally incorporated with a capital stock of $5,000,000, with headquarters at Montreal. It is understood that it is in this new concern the Montreal Steel Company and the Ontario Iron & Steel Company are to be merged. The Montreal Steel Company is now building a large modern plant at Lougue Pointe, Montreal. The Ontario Iron & Steel Company's works are at Welland, Ont. A syndicate has obtained a controlling proportion of the stock of each of the companies, and is believed to be behind the persons who applied for the incorporation of the Canadian Steel Foundries, Ltd.

The McClary Mfg. Company, stoves and tinware, London, Ont., has purchased 23 acres of land in the south end of the city, on which buildings are to be erected in connection with the company's business. It has also prepared plans for additions to its uptown plant.

The Western Bridge & Equipment Company has been granted a site by the city of Chatham, Ont., on which it will build an enlarged plant.

A company organized by W. J. Reid and Frank Reid of London, Ont., and Hugh Kennedy of Galt, Ont., will build an automobile factory at London, Ont., to manufacture the K-r-i-t runabout.

The Canada Motors Company, Ltd., has been incorporated at Galt, Ont., with a capital stock of $250,000, to manufacture motor vehicles. Geo. Dobbie has been elected president; A. U. Edwards, vice-president; C. Jansen, secretary; E. J. Getty, treasurer, and D. R. Perry, manager. A manufacturing plant is to be erected and equipped as soon as possible, but temporary quarters have been engaged for the production of the 1911 model.

The South

CHATTANOOGA, TENN., January 16, 1911.

A matter of considerable interest to machinery houses in the Southern trade is the report from Memphis, Tenn., that the shops of the Yazoo & Mississippi Valley Railroad Company will be removed from Vicksburg to Memphis and provided with considerable new equipment for repair work.

The Chattanooga Machinery Company of this place has been awarded the contract for an 8-ft. band mill of special design and auxiliary apparatus for an addition to the plant of the Otis Mfg. Company, New Orleans, La.

Plans have been completed by the Chattanooga Armature Works, Chattanooga, Tenn., for a large new shop building of brick construction, which will considerably extend its facilities for electrical work.

The Casey & Hedges Company, Chattanooga, Tenn., will soon have a new steel frame building to replace the portion of its plant that was destroyed by fire, and is otherwise improving its facilities for production during the current year.

The Columbian Iron Works, Chattanooga, Tenn., has effected many improvements in existing types of saw mill machinery, including quick receding set works, automatic, triple acting steel dogs and other patented devices, that enable it to start the new year with very favorable prospects.

The Chattanooga Coal Company, Durham Coal & Coke Company, Fox Coal Company and Hamilton Coal Company have been merged in a new organization, known as the Durham Coal & Iron Company, which will proceed at once to develop more extensively the properties of all three, with the object of doubling their present output. This calls for the buying of considerable equipment, to be installed at intervals during the year.

The Montgomery Light & Water Power Company, Montgomery, Ala., will increase the capacity of its hydraulic power station at Tallassee, Ala., which now has a capacity of 3500 to 4000 kw. New units increasing the output to 10,000 kw. may be installed.

Geo. E. Bushnell, general manager of the Tennessee Traction Company, Memphis, Tenn., is completing arrangements for construction work on the new electric railway to be built by that company.

Chas. J. Harris, who operates a leather factory at Dillsboro, N. C., will install electric power for his own use and public lighting.

Jesse L. Malcolm and others of Nashville, Tenn., have incorporated the Standard Brass & Metal Works.

The Cleveland Machine Works, Cleveland, Tenn., is to be enlarged and additional equipment installed for the manufacture of woodworking machinery. New interests have

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become associated with D. S. Myers in the ownership of the business, which will be extended in scope and volume.

The Woodlawn Ice Company, Birmingham, Ala., incorporated with $23,000 capital stock, will establish an ice plant. W. J. Worthington is president of the company and R. S. Mauchine secretary.

The Consumers' Ice Company, Birmingham, Ala., is being organized with $160,000 capital stock by G. G. Maass, M. M. Chaddock and Julius Marx.

Harrison Brothers have purchased a site in North Lone Oak, Tenn., on which they will soon erect a cotton gin. It is their intention to install five gin stands and other machinery which will give the gin large capacity.

The sugar house at the Destrahan plantation in St. Charles Parish, La., was destroyed by fire January 7. The owners are the Destrahan Planting & Mfg. Company. The loss, estimated at over $100,000, is partially covered by insurance. The capacity of the house was 500 tons daily.

The Salisbury Marine Construction Company, Salisbury, Md., recently incorporated with $25,000 capital stock, has acquired the property of the Salisbury Marine Railway Company at that place and will establish a plant to build yachts and other boats. A number of improvements are being made to the plant, including a marine yacht building shop, 70 x 120 ft., two stories; joiner building, 45 x 50 ft., two stories; storehouse and machine shop, 20 x 20 ft., two stories; paint shop and a power house equipped with an electric generator for lighting buildings and supplying power for portable and stationary tools. The new company will continue the operation of the marine railway.

The Southwest

KANSAS CITY, MO., January 16, 1911.

An election will probably be called next month at Kansas City, Kan., to vote on bond issues, including $350,000 for a municipal electric plant and $50,000 for two refuse incinerating stations.

Construction work will begin by or before summer on a new traction line to be built by the Manhattan City & Interurban Railway Company, plans for which have been prepared by C. M. Buck, formerly city engineer of Manhattan, Kan. The details of power equipment have not yet been worked out. Bonds in support of the enterprise have been voted by communities that will be benefited. Purchases of material will be in charge of Joseph T. West, Manhattan, Kan.

Work has been begun at Falls City, Kan., on the new machine shop for the Atchison Railway, Light & Power Company of Atchison, Kan.

An electric generating unit and modern pumping machinery will be purchased in the near future by the city of Moberly, Mo., if the present plans of the municipal authorities are carried through. Current for city lighting and industrial purposes is now supplied by the Moberly Gas & Electric Company, which has a plant of 375 kw. capacity.

Three new boilers supplied by the Casey & Hedges Company, Chattanooga, Tenn., and a Corliss engine from the works of the Filer & Stowell Company, Milwaukee, Wis., with other improved machinery, are being installed by the Arkansas Lumber Company, Warren, Ark.

New steam turbine units of 2000 kw. are to be installed in the main generating station of the Oklahoma Railway Company, Oklahoma City, Okla., in accordance with a decision recently reached. A Westinghouse set is at present in service. New substation equipment will also be added.

The report of an engineering expert, recommending extensive improvements in the pumping and water distribution systems at Oklahoma City, Okla., has been approved by the City Council, and an election on issuing $125,000 in bonds for the purpose will be held.

It is reported from Tucson, Ariz., that work will begin in the spring on new shops there for the Southern Pacific Railway, although this is not officially confirmed.

A plant for the manufacture of creosoted paving blocks is to be erected in the vicinity of Little Rock, Ark., by the Ayer & Lord Tie Company of Chicago and Memphis.

An election is to be held this month at Duncan, Okla., to vote on bonds for water works extensions, including additional pumping machinery.

The management of the San Juan Water & Power Company, Durango, Colo., which operates hydroelectric and steam power plants having a combined capacity of 5000 kw., contemplates extending its system to Farmington, N. M. This plan involves replacements and additions to machinery now in service.

The Flagstaff Lumber Mfg. Company, Flagstaff, Ariz., which has the most modernly equipped sawmill in the Far Southwest, is planning the installation of planing and box making machinery.

A steam driven generating set of 1000 kw. will probably be installed in a power plant to be erected in Tulsa, Okla., by the Tulsa Corporation.

A bond issue for the construction of water works has been sold at Hoisington, Kan., and the purchase of the necessary equipment will be made at an early date.

A power and pumping plant of large capacity is to be built by the Arkansas Natural Gas Company in the vicinity of Vivian, La., to supply pipe lines now being laid to Little Rock and other places in Arkansas. Air compressors will be used.

The Sheffield Sash Weight & Mfg. Company, Kansas City, has increased its capital stock to provide for the growth in the business.

A large stave mill is to be built at Waldo, Ark., by the Gulf Cooperage Company of that place and power machinery provided.

The Oklahoma Short Line Railway Company has been incorporated at Oklahoma City, Okla., by Leroy Paddock and others, to build an electric traction line from Oklahoma City to Joplin, Mo. None of the details of construction and equipment has, however, as yet been worked out. It is also proposed to build from Shawnee, Okla., to Denison, Tex., and the site for a power plant has been selected at a point near Shawnee.

The plant which was established at Marked Tree, Ark., by the Woodruff-Kroy Company, for the manufacture of staves, is proving inadequate to the demand made upon it and will be enlarged. Additional machinery is required.

The Eagle Mfg. Company, Kansas City, Mo., has signed a contract with the Muskogee Development Company, Muskogee, Okla., for the removal of its plant to that city. Work on the construction of a plant is to be commenced by March 1 and completed and ready for occupancy by July 1.

Britton, Okla., will expend $30,000 for the construction of a water works system.

The Elevator of the Rea-Patterson Milling Company at Lenapah, Okla., together with the Missouri-Pacific depot there, was destroyed by fire January 6, causing a loss of $10,000.

An election has been called by the city of Cherokee, Okla., to take place January 31, for the purpose of voting $5000 in municipal bonds for water works extension and sewage disposal.

The Cherokee Ice Company's plant has been sold to John Harris and R. B. Ash for $25,000. The new owners will make extensive improvements prior to the opening of the summer season.

The Northwest

MINNEAPOLIS, MINN., January 16, 1911.

A representative of the Barnett & Record Company of this city states that while few new contracts of importance are at present in sight, it is his judgment that business as a whole during 1911 will be much better than in 1910. R. R. Howell & Co., Minneapolis, who furnish complete equipments of their own manufacture for saw mills, from the smallest to the largest sizes, also look upon the situation as favorable to future business.

A representative wood-working concern, the Osgood & Blodgett Mfg. Company, reports trade good for the year, and from interviews with other firms in similar lines it is evident that that industry will call for a great deal of machinery equipment during 1911.

Bids will be taken early in February at Huron, S. D., on a pumping plant of 2,000,000 gal. daily capacity, to be operated by steam, gas or oil engines. The type of apparatus to be selected has been left open and alternate bids will be invited. The system is also to include a steel tower and tank of 200,000 gal. capacity.

The Minnesota & Ontario Power Company, of Minneapolis, has completed plans for the erection of a large timber-cutting plant at International Falls, Minn., and let the contract for the principal machinery.

G. L. Hunt, chief engineer of the Minneapolis, St. Paul, Rochester & Dubuque Traction Company, Minneapolis, is reported to be working on plans for a power plant in South Minneapolis.

The Minneapolis General Electric Company, Minneapolis, is taking immediate measures to remedy the loss incurred by an explosion at its steam power plant in this city; but the plans in detail have not yet been worked out.

The Cloquet Electric Company, Cloquet, Minn., which is equipped with three alternating current generators of 600-kw. capacity, engine driven, will provide for enlarged power facilities during the present year and extend its transmission lines to other communities.

The new electric generating plant of the Otter Tail Power Company, at Wahpeton, N. D., is nearly completed, and extensions of the service, involving the gradual pur-

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chase of considerable auxiliary equipment, will be made within the next few months.

The plans of the Idaho National Harvester Company, Moscow, Ida., for a works addition to double its present output, are reported to be practically complete.

The plant of the Somers Lumber Company, at Kalispell, Mont., is to be overhauled and new machinery installed, preparatory to a heavy run in the spring.

It is reported from Troy, Mont., that an electric power and pumping plant and water supply system will be installed there by R. E. Porterfield, under the terms of a franchise recently granted by the county board.

The City Council of Tower, Minn., will submit to the voters of that city the proposition of voting bonds to build a power plant at Pike River Falls.

The village of Argyle, Minn., will vote on a bond proposition for the installation of a water works system.

It is reported that the Pioneer Tractor Company, Winona, Minn., is planning the erection of an extensive machine shop, power house, test shop and foundry.

Texas

AUSTIN, TEXAS, January 14, 1911.

The development of fruit and truck growing in south Texas is causing the establishment of numerous ice and cold storage plants. One of the most important departures connected with the shipment of these perishable products is the proposed erection by the St. Louis & San Francisco Railroad of a number of pre-cooling plants at points on its lines in the lower Rio Grande and Gulf Coast territory. Chairman B. F. Yoakum is giving his personal attention to the establishment of these plants. The first to be erected will be located at San Benito and will cost about $50,000. The object is to remove the natural heat from the vegetables and other products before they are placed in refrigerator cars for shipment to market.

J. B. Cochran has purchased the ice plant of the People's Ice Company at Houston from P. B. Timpson, trustee for the bondholders. The plant will be rehabilitated and considerable new machinery installed.

Charles A. Alexander of Marble Falls, Texas, and associates, who are erecting a dam across the Colorado River at that place and installing a hydroelectric plant of about 30,000-hp. capacity, contemplates installing similar plants at Austin and at some other point on the Colorado River. They will soon begin the construction of electric power transmission lines to a number of towns and industrial centers situated within a radius of about 100 miles of Marble Falls.

The San Benito Sugar Mfg. Company will erect a sugar mill at San Benito, Texas, at a cost of $400,000. S. A. Robertson of San Benito is at the head of the project. The mill will be finished in time to care for next season's cane crop in that section.

The Provident Land Company will erect a large fig preserving plant at Provident City, Texas. This company is interested in the proposed installation of an electric light plant at that place.

The City Council of Marlin, Texas, is advertising for bids for the construction of a garbage crematory.

J. E. Baker of Killeen, Texas, has purchased the water and light plant at Lometa, Texas, from E. R. Goodson. He will make enlargements and other improvements.

The Marfa Electric Light & Ice Company, Marfa, Texas, will install a complete gas engine equipment.

The Travis Gin Company, Travis, Texas, will erect a cotton gin. O. E. Davis is at the head of the company.

The Valley Gin Company, Somerville, Texas, has been organized for the purpose of erecting a cotton gin. R. A. Brantley is one of the men interested.

The plant which the Sixela Fire Brick, Pottery & Coal Company will erect at Texline, Texas, will cost about $100,000. It will have a daily capacity of 60,000 brick.

The Texas Company, is planning for the removal of its extensive shops from Sour Lake to Houston if an available site is obtained at the latter place. It is stated that the shops will be enlarged and that a plant will be installed for the manufacture of supplies for pipe line purposes. The cooperage factory will also be enlarged.

The brick making plant which will be erected at Victoria, Texas, by the Southwestern Cement, Brick & Tile Company will have a daily capacity of about 25,000 brick. Those interested in the project are James F. Welder, Theodore Buhler and John Stoffels. Mr. Stoffels is manager.

V. S. Meinly, secretary and treasurer of the Corpus Christi Street & Interurban Railway Company, Corpus Christi, Texas, contemplates the construction of an electric street railway in Palestine, Texas. The proposed line may also be extended to suburban towns.

Andrew J. Zilker, of Austin, who recently took over the water works system at Taylor, Texas, will install a new pumping plant there. He has also agreed to increase the present storage capacity; to replace the wrought iron mains, both in the town and on the pumping line that runs to the plant on the San Gabriel River, with cast iron mains; to install 10-in. instead of 6-in. mains, and to install additional and larger pumps.

The plant of the Alamo Iron Works at San Antonio, Texas, is to be remodeled and enlarged. Several new buildings will be erected, a large blacksmith shop installed, and the entire plant equipped with the latest machinery. The output will be increased about 50 per cent, by the additions that are to be made. Eugene Holmgreen is secretary and treasurer.

The Farmers' Mfg. & Supply Company recently broke ground for five factory buildings which it will erect at Southton, a suburb of San Antonio, Texas. One of these factories will be devoted to the manufacture of wire fencing, wire buckets and baskets, screens, concrete reinforcements, &c., another will manufacture various articles from tin and sheet metal, particularly cisterns and tanks; the third will be devoted to the manufacture of plows and other farm implements and machinery; the fourth will turn out machinery for laundries, creameries and other kinds of industries; the fifth will be a large cotton-seed oil mill. The company has already erected a large cement block plant and cotton gin on its grounds. E. F. Anderson of Denver, Colo., is largely interested in the enterprise. C. H. Halt is president and general manager. In addition to the erection of these several manufacturing plants the company is building a new town at Southton.

J. S. Douglas of Douglas, Ariz., and W. H. Prophy of Bisbee, Ariz., have been granted a franchise to install a water works plant at Benson, Ariz.; also for the furnishing of the town with electric light and power. The electric current will be transmitted to Benson from the power plant at Douglas.

Leoncio Hernandez will install a hydroelectric plant near Pachuca, Mexico, having recently obtained a concession from the government for the purpose.

The Canadian Colonization Company, which has its headquarters at Victoria, B. C., is arranging to expend about $3,000,000 in the construction of a large system of irrigation and the making of other extensive improvements on its 1,000,000-acre tract of land in the state of Guerrero, Mexico. It will construct many miles of irrigation canals, install pumping machinery, build a short line of railroad and dredge a deepwater harbor at the mouth of the Petatlan River. The project also involves the construction of two large dams across that stream for the purpose of storing water to be used in irrigating.

J. H. Hodson of New Orleans, La., will erect a large lumber mill in the vicinity of Llano Grande, state of Durango, Mexico.

The Eller Wagon Works, Houston, Texas, has increased its capital stock from $20,000 to $40,000.

The Foote-Rolaff Machinery Company, San Antonio, has been incorporated, with a capital stock of $10,000. The incorporators are W. G. E. Rolaff, Geo. W. Foote and B. V. Samuel.

E. F. Glaze of the Goliad Water & Light Company, Goliad, Texas, has plans ready for the erection of an ice plant, work on which is to begin at an early date. As soon as this is completed a poultry packing plant will be erected.

The Paul Garrett Milling Company will erect at San Angelo, Texas, a new flour mill on the site of the one recently destroyed by fire. The building will cost about $10,000 and the machinery $15,000. An elevator will also be built at a cost of $15,000.

Farther Central West

OMAHA, NEB., January 16, 1911.

Information from dealers in construction material, whose trade is a good indication of prospective activity in the various lines of shop, mill and factory equipment, is to the effect that an excellent spring business is in prospect. Railroad buying also promises to be much heavier than last year.

Among orders recently entered by the Clinton Bridge & Iron Works, Clinton, Iowa, is one for the construction of two steel spans over the Rock Island River for the city of Rock Island, Ill.

The C. Shenkburg Company, Sioux City, Iowa, will build in the vicinity of Third and Douglas streets, a new power plant, 50 x 86 ft., two stories, with a 125-ft. stack. The machinery to be installed will provide electric power and lighting, with sufficient boiler capacity to furnish heat for the company's entire establishment.

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K. C. Kastberg, city engineer of Boone, Iowa, will be in charge of the extensive water works system to be constructed there, a bond issue of $180,000 for which has been voted. The purchase of modern high duty pumping units, with much auxiliary equipment, will be involved in due course.

Bids will be taken about February 25 at Atlantic, Iowa, for remodeling and equipping the city power and pumping station.

Tenders are reported to have been invited for an elevated steel tank to be erected for Newton, Iowa.

The A. R. Flick Box Company, Dubuque, Iowa, whose woodworking plant burned about three weeks ago, will replace it with a thoroughly modern factory, to be operated by electric motors.

It is reported from Bonaparte, Iowa, that S. E. Irish, who recently purchased the dam there, resides at Keosauqua, Iowa, and that Geo. H. Craig of that place has been retained to prepare plans for a hydroelectric plant of 900 to 1000 kw. It is also stated that the financial arrangements will be in charge of J. A. Johnson, Bonaparte, Iowa.

The City Council at Hamilton, Iowa, has under consideration the project of constructing a pumping plant.

Funds for building an electric power and pumping station and laying suitable service systems will be provided shortly at Giltner, Neb.

The Inter-Mountain Bridge & Construction Company, Tecumseh, Neb., now has in hand the contract for a complete water works system, to be constructed for the municipality of Stratton, Neb.

At Fairbury, Neb., the city has secured control of the 300-kw. power plant of the Fairbury Electric Light & Power Company, which was long a matter of litigation, and, in addition to some minor improvements already made, will spend about $35,000 for betterments to the system.

To install a public service plant at Valparaiso, Neb., which is now without one, the Valparaiso Electric Company has been organized.

W. P. Robinson, manager of the Denver Union Water Company, Denver, Colo., has had plans drawn for the proposed auxiliary pumping station, of 5,000,000 gal. daily capacity, to be erected in University Park.

The Martin Mfg. Company, Mason City, Iowa, advises that the report recently circulated throughout the country to the effect that its plant was destroyed by fire is false. The company has had no loss of any kind by fire and its plant is being operated to full capacity.

Bids will be received by Atlantic, Iowa, March 1, for improving the electric light and power plant and uniting it with the water works system at a probable cost of $40,000.

Whittmore, Iowa, will expend $7000 for the construction of a water works system.

Gordon, Neb., is preparing estimates for a water works system to be constructed at a cost of $12,000.

The power house, two machine shops and the sheds of the Mason City Brick & Tile Company's plant, Mason City, Iowa, were burned December 30, involving a loss of $25,000.

A large ore smelting plant is to be erected at Alma, Colo., by the Moose Smelting & Refining Company, recently incorporated for $5,600,000. Henry W. Scott, of the Scott, Bond & Mortgage Company, New York City, who is one of the principal owners of the Moose mine at Ada, will be the managing director. The plans of the enterprise call for an initial expenditure of about $3,000,000 for buildings, equipment, trackage and various details of construction work.

It is reported at Dubuque, Iowa, that a site has been secured there by the Brunswick-Balke-Collender Company for a factory guaranteed, under the terms of a bonus raised by local business interests, to employ at least 500 men. Work upon it will begin next month.

Announcement is made of a one-story extension, 40 x 80 ft., of the Waterloo Malleable Iron Company's works, Waterloo, Iowa, a three-story factory, 47 x 60 ft. for the Waterloo Plaster Company and a further addition to the plant of the Waterloo Drop Forge Company, the plans for which are said to be not yet complete.

From Hamburg, Iowa, it is reported that in consequence of a franchise granted last month, E. B. Hillman of Peoria, Ill., will build an electric generating plant for public service.

The new factory which has been planned for erection in Des Moines, Iowa, by the Farley & Loetscher Company, Dubuque, Ia., will be operated under the name of a new concern, known as the Loetscher-Jeager Company, in which W. C. Jeager of the Jeager Mfg. Company, Des Moines, is interested. Machinery for the manufacture of sashes, doors, &c., together with electric power equipment, will be required.

The Pitts-Matthews Carriage & Auto Company, Des Moines, incorporated for $10,000, will construct a building 45 x 132 ft. for motor-car repairs and finishing.

A five-story factory, 100 x 150 ft., which will probably be equipped with its own power plant, electric motors, &c., will be erected in Sioux City, Iowa, by the Johnson Biscuit Company.

The Rice-Dayton Mfg. Company, Cedar Rapids, Iowa, will start work in the spring on an addition to its plant.

A three-story building, 65 x 70 ft., with motor-driven equipment, will be added to the plant of the R. Hurni Packing Company, Sioux City, Iowa.

A new sub-station, equipped with power-transformers, rotary converter, &c., will be erected in Iowa City, Iowa, by the Cedar Rapids & Iowa City Railway & Light Company, Cedar Rapids, Iowa, and other improvements effected in the system. An expenditure of $80,000 for this purpose has been decided upon for the coming year. The company has a generating plant of 3500-kw. capacity at Cedar Rapids, Iowa, to which an exhaust steam turbine unit may be added, and also maintains a well-equipped repair shop there.

The large shoe factory of Bentley & Olmsted, Des Moines, Iowa, has been destroyed by fire and will be rebuilt.

A new elevator will be constructed at Gruver, Iowa, by Henry Rippe, of that place, and Fairmont, Minn., to replace one that burned.

Machinery will be purchased by the Red Oak Canning Company, Red Oak, Iowa, early in the coming month, for an extension doubling the capacity of its plant.

Bids will be taken about February 24, or a little later, for the improvements recently mentioned at Atlantic City, Iowa, which will take the form of remodeling the municipal power and pumping plants so as to bring them under one operating control and increase their capacities.

The installation of a municipal water works system is being planned at Steamboat Rock, Iowa.

The Minneapolis Threshing Machine Company, of Minneapolis, Minn., is planning the construction of a branch, 40 x 200 ft., at Mason City, Iowa, to be used for assembling and storage, as an aid to the prompt delivery of its apparatus on orders from that section.

The City Council of South Omaha, Neb., has granted the Union Stockyards Company and packers of that place a franchise to construct their own pumping plant and water system.

It was recently decided at Stratton, Neb., to install an electric plant for municipal service and the work will be proceeded with as soon as possible.

The Centerville Light & Traction Company, Centerville, Iowa, is planning extensive improvements which will include the rebuilding of the central heating plant and the installation of a new 300-hp. boiler.

The Woods Brothers Thresher Company, Des Moines, Iowa, has been incorporated to take over the business of the Wood Brothers Steel Self-Feeder Company. The capital stock has been increased to $600,000 preparatory to enlarging the factory and greatly increasing the output.

The Excelsior Steel Furnace Company, Chicago, will establish a branch factory in Des Moines, Iowa, at Second street and the Des Moines Union tracks. R. A. Walker of Chicago will have charge of the Des Moines branch.

The Lenox Furnace Company, Marshalltown, Iowa, is securing options on land on which it will build early in the spring a stove factory. The company has been making steel ranges for a year and the business done warrants enlarging the plant. The stove business will be incorporated separately from the furnace business.

The plant of the Alfalfa Meal Company at Council Bluffs, Iowa, valued at $50,000, was burned January 11.

The Decker Mfg. Company, Keokuk, Iowa, will erect a three-story garage and manufactory at Third and Blondeau streets. The company will install two boilers and two electric elevators.

The Taylor Mill & Elevator, Dannebrog, Neb., was burned January 10, causing a loss of about $10,000. The plant will be rebuilt at once.

North Pacific Coast

PORTLAND, ORE., January 13, 1911.

A fair index of the present flourishing, stable condition of the metal working industries on the north coast, inclusive of machinery building and repairing, is to be found in the activity of the Willamette Iron & Steel Works of this city. It is now busy in every department, particularly the boiler, tank and hydraulic pipe shops. Marine work continues fair and logging engines have recently been in good demand for the season. To provide for the further increase in business which it is believed from present inquiries will develop in the spring, additional equipment is being installed and the layout of the shops improved, so as to secure the highest possible efficiency in all branches of production.

The Meese & Gottfried Company of San Francisco and Seattle, whose specialty is the manufacture and installation of power transmission, elevating and conveying machinery,

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has opened a branch at 67-69 Front street, Portland, Ore., with H. F. Gearson in charge. Business in the new location started with the first of the year.

In order to encourage the location there of manufacturing industries, by providing better shipping facilities, the Port of Coos Bay, Ore., has voted $500,000 in bonds to cover the cost of harbor improvements.

The city of Gresham, Ore., has retained Louis C. Kelsey, Dooly Building, Salt Lake City, Utah, who has also opened an office on the coast, to plan the construction of water works.

A match factory is to be built in Springfield, Ore., by Paul Bettelheim. Further details are lacking.

The Coquille Mill & Mercantile Company, Coquille, Ore., whose buildings were wrecked by a boiler explosion, is preparing to rebuild. The electric power plant connected with the saw mill, which is operated as the Coquille River Electric Company, has already been replaced.

A power station is to be built at Magoon Lake by the Eastern Oregon Light & Power Company, Baker City, Ore., which has in operation at the latter place a combined steam and hydroelectric plant of 3200-kw. capacity. The company is planning to furnish power extensively for motor-driven machinery used in irrigation works. The equipment now in service includes Cahill boilers, a Nordberg engine, Pelton water wheels and General Electric and Westinghouse dynamos.

Improvements are being made in the plant of the Western Oregon Lumber Company, Portland, Ore., and additional apparatus, including the new pneumatic system of trimmer operation, installed. The machinery will be furnished by the Summer Iron Works, Everett, Wash.

The project for a municipal pumping plant at Ashland, Ore., will be delayed indefinitely, as a bond issue of $170,000 was defeated in the recent election.

Additions are to be made to the equipment of the Pioneer Planing Company's plant at Ashland, Ore., and changes effected that will materially increase its output.

The Nisqually Iron Works, Tacoma, Wash., which acquired the shops formerly operated by the Tacoma Eastern Railway, has kept very busy on repair work and in manufacturing equipment for logging purposes, including a number of very salable specialties. It is starting in on the new year under most favorable auspices.

The Ketichan Power Company, Ketichan, Alaska, which is a center of canning operations, will extend its facilities, including the enlargement of the saw mill which provides lumber for boxes. The output of the box factory is also to be increased correspondingly.

A saw mill, which will probably be electrically operated, is to be erected in Camas, Wash., by Peterson Bros.

A new power station was recently completed by the Whatcom County Railway & Light Company, Bellingham, Wash., giving it upward of 5000-kw. capacity, and further improvements are to be effected during the year.

A thoroughly modern box factory is to be constructed in the near future at Clarkston, Wash., by the Valley Lumber Company, including the installation of motor-driven machinery. The equipment of its timber cutting plant is also to be enlarged.

Bids are being taken by the city of Spokane, Wash., on two horizontal 14-in., two-stage centrifugal pumps, a 900-hp. three-phase, 60-cycle, 2200-volt induction motor, and a separate motor-driven centrifugal unit of 3,000,000 gals. daily capacity, together with switchboard and control apparatus, &c., for high pressure water service.

The plant of the Page Lumber Company, Buckley, Wash., which recently burned, will be rebuilt.

Government Purchases

WASHINGTON, D. C. January 16, 1911.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids February 4 for one 60-ton electric traveling crane for building No. 23, Norfolk Navy Yard.

The Paymaster General, Navy Department, Washington, will open bids January 31, under schedule 3255, class 22, for furnishing one exhaust fan motor and dust collecting system.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids January 10 as follows:

Class 1.—One overhead traveling electric crane—Bidder 12, Alfred Box & Co., Philadelphia, Pa., $1675; 77, Hoisting Machinery Company, New York, $1518; 103, Modern Steel Structural Company, Waukesha, Wis., $1820; 120, Niles-Bement-Pond Company, New York, $2100; 156, Toledo Bridge & Crane Company, Toledo, Ohio, $1700; 167, Whiting Foundry & Equipment Company, Harvery, Ill., $2315; 179, Northern Engineering Works, Detroit, Mich., $1850; 184, Butte Engineering & Electric Company, San Francisco, Cal., $2280.

Class 11.—One screw-cutting engine lathe—Bidder 26, Caldwell Brothers Company, Seattle, Wash., $1210; 64, Garvin Machine Company, New York, $1311 and $1213; 75, Hallidie Machinery Company, Seattle, Wash., $1265; 107, Manning, Maxwell & Moore, New York, $1463; 128, Perrine Machinery Company, Seattle, Wash., $1104; 143, Springfield Machine Tool Company, Springfield, Ohio, $1325.

Class 13.—One 2-kw. constant speed motor generator and one 2-kva. open core wireless telegraph transformer—Bidder, Diehl Mfg. Company, Elizabethport, N. J., $1975; 95, Fritz Lowenstein, New York, $1600; 122, National Electrical Signaling Company, Pittsburgh, Pa., $1065; 157, Telefunken Wireless Telegraph Company, New York, $1150.

Class 51.—One set of speed gears, one set of motors, with controlling appliances, and one set of four distant control apparatus for above gears—Bidder 30, Cutler-Hammer Mfg. Company, Milwaukee, Wis., $8160; 42, Diehl Mfg. Company, Elizabethport, N. J., $3744, part; 59, General Electric Company, Schenectady, N. Y., $3449.

Class 53.—One bolt heading, upsetting and forging machine—Bidder 58, Frevert Machinery Company, New York, $2724; 107, Manning, Maxwell & Moore, New York, $2750.

Class 54.—One steam winch—Bidder 70, Hyde Windlass Company, Bath, Me., $460 and $550; 92, Lidgerwood Mfg. Company, New York, $1076; 173, Williamson Brothers Company, Philadelphia, Pa., $750.

The Bureau of Yards and Docks, Washington, opened bids January 7 for furnishing and installing one electric motor driven capstan at Portsmouth, N. H., Navy Yard as follows: Hyde Windlass Company, Bath, Maine, $2200; Williamson Brothers Company, Philadelphia, Pa., $2295.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids January 3, as follows:

Class 1.—Two Bement vertical drilling machines—Bidder 29, Fairbanks Company, Washington, $569 and $687; 37, Garvin Machine Company, New York, $415 and $445; 48, J. P. Kemp, Baltimore, Md., $427, $442 and $568; 64, Niles-Bement-Pond Company, New York, $570; 80, Vermilye & Power, New York, $444.90.

Class 56.—Four portable ventilating sets—Bidder 26, Diehl Mfg. Company, Elizabethport, N. J., $76; 73, B. F. Sturtevant Company, Hyde Park, Mass., $75.

Congressman Underwood's Tariff Views

A reporter of the New York *Herald* has interviewed Representative Oscar W. Underwood of Birmingham, Ala., who is expected to be Chairman of the Ways and Means Committee of the House of Representatives of the Sixty-second Congress, and will, therefore, take an important part in the revision of the tariff. Some extracts from the interview as printed in the *Herald* of January 15 are given below:

"Would you mind stating your tariff theory in more detail?"

"I would be glad to, because I often find myself in the anomalous attitude of having some of my constituents who are protectionists declare that I am a free trader, and I often find that when I am in Washington some of my colleagues, because I represent a great manufacturing district, assert that I am a protectionist. In the preparation of a tariff bill the differences that exist between the two great parties are not the issue of protection against free trade, but the true issue is that one desires to write a tariff bill that leans toward prohibition of imports and the other a revenue tariff that favors fair competition. Although we occasionally find a free trader within the ranks of the Democratic party the great rank and file do not favor the free trade doctrine. There has never been a platform of a national convention since the organization of the Democratic party that has advocated free trade theories. They have always maintained that the true position of the party was in favor of a tariff for revenue. There has never been a tariff bill enacted into law by the Democratic party that has not favored the doctrine of a tariff for revenue as opposed to a tariff levied along free trade lines, such as the revenue laws of Great Britain."

"What do you think of the plan to revise the tariff schedule by schedule?"

"I am heartily in accord with it. I believe it can be done intelligently that way. It cannot be when a committee has to take up all the schedules at once. It is the only sensible way to revise the tariff. It eliminates trading, which has been the main cause of trouble in the past and has destroyed most of the great tariff bills. That is what has been chiefly responsible for 'jokers' and their other bad features."

"If you were asked especially to tell the business men of the country what you will stand for in the way of a tariff bill, what would you say?"

"I would simply say that I believe in a tariff for revenue only, but with that principle carefully and conservatively worked out. I would also tell them that they are not going to get from my committee a high protective tariff bill to protect their profits."

Obituary

JOHN W. SEAVER

John W. Seaver, consulting and contracting engineer, Cleveland, Ohio, died suddenly January 14, from apoplexy, as he was about to start from his home for his office. He was 55 years of age, having been born in Madison, Wis., in 1855. His early life was spent in Buffalo. He entered the field of mechanical and civil engineering when a young man and made a world-wide reputation. He was a pioneer in designing coke oven machinery.

At the age of 13 Mr. Seaver went to work for the Shepard Iron Company, Buffalo, as a machinist. Two years later he was promoted to the drafting room. Later he was made superintendent of the plant. While acting

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as superintendent he designed the engines of many lake boats, among them the engines for the Great Western, a noted vessel in its day. When he was 23 he went to Pittsburgh, where he became connected with the Schultz Bridge Works. While with that company he designed and built a large number of bridges. Later he engaged with the Riter-Conley Mfg. Company.

Mr. Seaver removed to Cleveland 15 years ago from Pittsburgh, and in that city joined his interests with those of others in the Wellman-Seaver-Morgan Company, of which he was vice-president. About four years ago he withdrew from that company, and, with J. E. A. Moore as a partner, opened an office as consulting and contracting engineer, the business being conducted under the name of Mr. Seaver. He was the first designer and builder of Gantry cranes and other important material handling and steel manufacturing machinery. He was a noted book lover, and had an extensive library and a collection of autographs of famous engineers. He was a member of the Rowfant, Union and Euclid clubs in Cleveland, and of the Cleveland Engineering Society, the American Society of Civil Engineers and American Society of Mechanical Engineers. He leaves a widow and four children.

JAMES BARNETT, president of the George Worthington Company, Cleveland, Ohio, wholesale and retail hardware dealer, who had for a long time been called Cleveland's first citizen, died January 15, aged 89 years. He was born in Cherry Valley, N. Y., his parents removing to Cleveland when he was two years of age. After finishing his education in the Cleveland public schools he entered the hardware store of Potter & Clark, and three years later became an employee of George Worthington. Later he became a partner in the concern under the name of George Worthington & Co., and was the senior partner from the time of Mr. Worthington's death in 1874 until the present George Worthington Company was incorporated in 1887. From the time of its incorporation until his death he was president of the company. He took an active interest in the iron industry in Cleveland in its early days as one of the owners and vice-president of the Cleveland Iron Company that operated a blast furnace for a number of years. He was also prominent in banking circles, serving as president of the First National Bank from 1876 to 1905, and being on the directorates and holding other official positions with other Cleveland banks at various times. He took a deep interest in political matters and was a leader in civic affairs and charities, devoting much time to philanthropic and civic work as the head of various organizations and in other prominent capacities. He served his country through the Civil War during which he won great distinction. He entered the service as a colonel and rose to the rank of brevet brigadier general for gallant and meritorious services. He leaves three daughters, one of whom is the wife of Alexander Brown, vice-president of the Brown Hoisting Machinery Company.

JOSEPH C. POULTERER, who some seven years ago retired from the iron and steel business, which had been conducted under the name of Poulterer & Co., Philadelphia, Pa., died at his home in that city January 13, aged 50 years. He leaves a widow and two sons.

ROBERT J. GARDNER, superintendent of the S. Jarvis Adams Company, Midland, Pa., is dead, aged 35 years. For several years he was superintendent of the wire department of the Schoenberger Works of the American Steel & Wire Company, Pittsburgh.

DAVID BOVAIRD, senior member of the firm of Bovaird & Co., Bradford, Pa., died January 4, aged 78 years.

Personal

W. S. Chase, sales manager, and P. E. Ryan, advertising manager, of the National Acme Mfg. Company, Cleveland, Ohio, sailed from New York for Europe January 14. They will spend several weeks in England and on the Continent looking after the interests of their company.

W. P. Pressinger, having sold his interest in the Keller Mfg. Company of Philadelphia, has resigned as vice-president to again become manager of the compressor department of the Chicago Pneumatic Tool Company, with headquarters in New York.

The firm of D. C. & Wm. B. Jackson, Boston, Mass., has been retained by the British Government to advise the Postmaster-General in regard to the value of the plant of the National Telephone Company, which will be taken over by the government this year and made a part of the post-office system. Prof. D. C. Jackson sailed for England January 18 to spend a week in London conferring in regard to the execution of the valuation, expecting to return by a steamship due to arrive in New York February 7.

J. O. Entrekin, for a number of years secretary of Sloan, Howell & Co., dealers in iron, steel and contractors' supplies, Philadelphia, Pa., has resigned to become associated as sales manager with the Lebanon Valley Iron & Steel Company, Lebanon, Pa., now manufacturing a complete line of bolts, nuts, rivets, track bolts, bar iron and bar steel.

J. F. Doolittle, president of the Cleveland Steel Tool Company, Cleveland, Ohio, has started on an extended vacation trip of four months. As his time will be spent entirely in recreation, he will tour by easy stages through

the Isthmian Canal district, Old Mexico, Southern California and Yellowstone National Park, returning to business about May 1.

H. H. Barbour has been appointed district sales agent of the Lackawanna Steel Company for the metropolitan district, with offices at 2 Rector street, New York, this appointment becoming effective January 19, on the removal of the general sales office of the company to its works at Lackawanna, Erie County, N. Y.

E. T. Weir, president of the Phillips Sheet & Tin Plate Company, Weirton, W. Va., has sailed for Europe.

F. A. Botts has been transferred from the Birmingham, Ala., to the New York pig iron selling force of Hickman, Williams & Co.

R. H. Watson, for several years second assistant to A. R. Hunt, superintendent of the Homestead Steel Works of the Carnegie Steel Company at Homestead, Pa., has been appointed superintendent of the open hearth department, to succeed Reese James, who died recently.

D. B. McClelland, vice-president and treasurer of Spang, Chalfrant & Co., Inc., Pittsburgh, has gone on a Western business trip and will be absent about six weeks.

C. B. Walter has been appointed district manager of the Pittsburgh office of the Russell Machine Company of Massillon, Ohio, succeeding F. G. Borden. Mr. Walter has been connected with the Pittsburgh office for several years.

Geo. G. Crawford, president of the Tennessee Coal, Iron & Railroad Company, Birmingham, Ala., will sail in February for a European trip of two or three months.

The Engineer as a Salesman

BY STERLING H. BUNNELL.

The increasing complication of manufacturing processes and the specialization of manufactures into peculiar lines have brought into the field of consulting engineering numerous specialists, each expert in a narrow field, which may so absorb his efforts that he will have little time to acquire a broad knowledge of other lines. In the construction of steam power plants, the development of water power, the design of electric central stations and the construction of street railroads, engineers of a high degree of specialization can be found adequately equipped to solve the most intricate problems, and to produce designs and superintend construction which will give a successful and satisfactory working plant. On the other hand, it becomes increasingly difficult to find engineers of broader general knowledge, though less specialized in particular lines, who can undertake problems involving a number of different fields, such as are met with in new lines of manufacture.

To the prospective owner or manager of a plant for manufacturing some new product, a problem is presented involving location, design of power plant and transmission, design of buildings, organization of operating force, and selection of machinery among standard lines obtainable in the market, special construction which can be adapted for the particular purpose, and newly designed machinery which must be made up largely without precedent. In factories of usual size there is not enough work in any one line to indicate the selection of a consulting engineer to take charge of all. Further, the most expert engineer in each line has carried his studies in refinements and economies to a point far beyond what is justifiable in connection with a small installation of his special apparatus. The noted power plant engineer, for instance, regards a factory power plant of 100 or 200 hp. as a mere nothing, in comparison with the 20,000-hp. plant, which he considers of only ordinary size. The man charged with the design of a new plant is, therefore, likely to be taxed with selecting the best among many consulting engineers, and in deciding for himself the questions of difference which arise between them.

The easy way out of these difficulties lies in accepting the services of the engineering salesman who combines the functions of advisory engineer with the salesman's knowledge of mechanical construction and cost. In machinery lines to-day the technical man is rapidly taking his place as a prominent member of the sales department. At the same time, the business trained salesman, forced by competition with the technical man to study the theory of his product, has learned enough of the technicalities to hold his own successfully against the other, so that there is little to choose between the engineer trained in selling and the salesman trained in engineering.

A machinery house handling a wide variety of material and equipment, and employing a force of salesmen with general mechanical knowledge, is well equipped to assist in the construction of a factory in an advisory capacity. An engineering salesman is alive to the question of costs, first and foremost. While he has a general knowledge of competing lines he has also a wide knowledge of noncompeting lines, through his general acquaintance with other machinery salesmen and with the purchasing public. A competent engineering salesman who is in a position to devote his undivided attention to a manufacturing proposition can give advice and assistance from the commencement of design to the completion of the last payment, which is of the greatest value to the owner and constructor. The services of such a man cost the purchaser nothing; they are paid for by reason of the increased total selling commission realized by the machinery house, which is thus enabled to furnish the entire equipment, instead of being limited to one or two parts only. In fact, since an engineering salesman can figure closer on a large equipment than on a few scattered items, the total cost of the entire contract may be less than the sum of the costs of the various items if purchased separately, and the services of the engineering salesman, being paid for from the saving in expense, are without cost to the purchaser.

The Griscom-Spencer Company, New York, with which the writer is connected, is a typical concern which is furnishing engineering advice and machinery equipment, working in co-operation with the purchaser's engineers. This company, under the name of the James Reilly Repair & Supply Company, operated a general machinery and supply business for many years. In the course of time it purchased or developed a number of steam specialties. The experience gained in original design, in reducing successful design to a manufacturing basis, and in purchasing for the supply business, called for the employment of one technical man after another, until the engineering and selling force of the company grew to a score of men, the majority technical graduates, the rest trained in practical salesmanship. Among such a force special experience and practical knowledge of many diversified lines of manufacture are found ready at hand for the advice and guidance of a prospective purchaser, who thus becomes the client of an engineering firm of wide experience in construction and purchase, as well as in design. The engineer or manager charged with the construction of a factory of new design or peculiar construction can find in such a force the best of practical advice and assistance on every point, from the first line of drawing to the last detail of equipment. The engineering fee is paid solely from the elimination of wasteful competition, the saving in time spent in unnecessary correspondence and visits, and in the investigation which will be necessary in obtaining the information which is already in possession of the force of engineering salesmen.

To supply the increased demand for the old-fashioned iron sheets the Empire Iron & Steel Company, Niles, Ohio, is installing four additional puddling furnaces. The company states that it has always done considerable business in this line and that the trade that it has established has taken practically all of its output. With the view of taking care of a larger trade in pure iron sheets the installation of equipment to produce a greater tonnage was decided upon.

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Large Basic Open Hearth Furnaces

Features of Practice with Heats Averaging Over 87 Tons

BY THEO. D. STRAUB.

Recently in one of our technical schools, during a talk on the metallurgy of steel made in the basic open hearth furnace, the speaker mentioned to the class the fact that the limit in size for economical production with a cold charge had been approximately 65 tons. Thereupon a student contributed to the informal conversation by saying, "I was told the other day that there are furnaces in operation with a capacity of 80 to 100 tons," and he gave his authority.

It might be of some interest, therefore, to give a brief outline of the practice carried on in an open hearth furnace of this size at the new plant of the West Penn Steel Company, Brackenridge, Pa. At the outset it may be stated that the operation of producing mild steel in large quantities at a cast has proved so successful as to warrant the company in building a second furnace of the same type and size; the gas was turned on July 1, 1910, in this second furnace, which has been in use steadily ever since.

The first furnace built at Brackenridge, using natural gas as fuel, was put in operation October 15, 1909, and was operated with only minor repairs until the latter part of May, 1910, when slight repairs to the breast and sides were made. During this run 298 heats, averaging over 87 tons, were tapped from this furnace. It is rated at 80 tons, but the average was almost 10 tons more to the heat. A few heats have run up to 100 tons and one to 107, which was the largest—144 ingots. Moreover, after this run the furnace was only partly repaired. At the time of writing this—the latter part of December, 1910—the record of the furnace stands at 520 heats with original roof.

Construction, Charging and Melting

The principles of construction are essentially the same as those of the prevailing type of fixed or stationary furnaces—rectangular melting chamber, regenerators, checkers, pan of heavy riveted plate steel carried on beams supported on especially heavy foundation, walls, &c. The construction throughout is exceedingly heavy and solid because of the size of the charge, which runs up to 250,000 lb. The angle of the ports is about the same as on a smaller furnace. The use of natural gas as fuel is, of course, an advantage. The hearth platform is large and very convenient and ample room is afforded for the charging machine and general opeations.

The charge of limestone, pig and scrap iron is brought up on an incline to the hearth platform in trains of boxes, which are unloaded in the furnace by an improved charging machine. The operation of charging requires an average of about four and one-half hours. Melting and manipulation of the fusion require about 10 to 12 hours more, so that under usual conditions a heat is expected every 13½ or 14 hours, though the time necessary to get proper results has been a trifle more or less.

After the steel has been refined to the right stage it is tapped from the furnace into a large, suitably lined ladle, which, motor driven, runs on a track over the pit. The whole melt is allowed to run out from the furnace, the slag running out of the ladle on the side opposite the molds into slag boxes so arranged that they take care of all the slag. The steel is immediately poured from the bottom of the ladle into the fountain of a group which fills eight molds at a time from the bottom, the eight molds of a group being suitably connected with runner brick on the floor of the oblong pit.

The ingots measure 10 in. square on the small end, 13 in. square on the large end, and are from 45 to 55 in. in hight. They weigh in the neighborhood of 1750 lb. each, depending upon the size required. Immediately after tapping the furnace bottom and tap hole are cleaned out by means of compressed air and charging operations are begun.

In stripping the pit the caps are first removed and then the electric crane overhead lifts four molds at a time until all are out. Then by throwing the chains over the farthest two ingots at each end a group of eight ingots is lifted by the crane from the pit to the scales, whence they are carried to the soaking pits as required. By means of old runners with their cores of steel, placed in each corner of the slag boxes, the crane also lifts the slag out when cool in one mass. It is then removed to its place for disposal in cars awaiting it.

Uniform Conditions Secured

The mild and semimild steel made in these furnaces is for various purposes, including high grade bars and sheets. Phosphorus has been eliminated to 0.01 and sulphur to 0.022. The arrangement is such that all operations are under excellent control of the skilled melter and his assistants, who claim it is not any harder to manipulate a large furnace than it is a smaller one, as conditions are more uniform. These furnaces were constructed by the S. R. Smythe Engineering Company of Harbison & Walker brick, and have been in continuous operation ever since started. There is no trouble in keeping the melt hot long enough during the operation of casting. The steel is of highly satisfactory quality and the cost per ton for labor, fuel, &c., compares most favorably with that of steel produced similarly in a smaller furnace, for the equipment of the West Penn Steel Company's plant is of the highest efficiency developed by modern practice.

Isolated Plant Protective Association.—The first steps toward the formation of an Isolated Plant Protective Association were taken at a meeting held in the Engineering Societies Building, 29 West Thirty-ninth street, New York City, on Monday evening, January 16. The aims of this association are to further the interest of isolated plant owners and to increase the number of such plants throughout the country. Organization was effected by electing Charles G. Armstrong temporary chairman, and Ernest Fieux temporary secretary. A committee was appointed to draw up a constitution and set of by-laws for the association, and will present its report at a meeting to be held on the evening of January 30, when the permanent officers will be chosen.

The American Wire Fabrics Company, Clinton, Iowa, has filed articles of incorporation, with an authorized capital stock of $1,500,000. The new corporation will be successor to the American Wire Cloth Company and will manufacture all kinds of wire cloth, wire nettings, cables, nails, fencing and other wire products. The company has plans prepared for an extension to its plant which will practically double its capacity, and on which work will be commenced as soon as weather permits. The officers of the new company are as follows: H. W. Seaman, president; C. L. Hoff and A. F. Norrish, vice-presidents; C. K. Anderson, secretary and treasurer.

The Vierling Steel Works, Chicago, has been incorporated to carry on the business formerly conducted under the style of Vierling, McDowell & Co. The capital stock of the new company is $250,000, an increase of $150,000. This increase in capital was made necessary to cover expensive improvements that have been completed the past year in the company's plant at Chicago. The power equipment has been changed from steam to electric motors and a large increase has been made in the fabricating equipment, giving the company one of the largest plants in the West for the fabricating of structural material.

The Pittsburgh office of the Erie City Iron Works, Erie, Pa., has received an order from the American Sheet & Tin Plate Company for 400-hp. vertical water tube boilers to be installed in the Pittsburgh Works, at New Kensington, Pa.

Canada's Economic Upbuilding

TORONTO, January 14.—American and other onlookers of Canadian developments must be impressed with the rate at which construction is going on all over this country. The spirit of enterprise, active though it has been for the greater part of the decade that has just closed, never before entered so largely into what may be called town building and city improvement as it did in 1910. "Town building" and "city improvement" are not used simply in reference to public undertakings, but comprehend everything done, whether by municipal or private enterprise, that conduces to the production of wealth.

Railroad Building

For some years the conspicuous feature of the country's development was the building of railroads—the construction of the National Transcontinental, the rushing of the Canadian Northern from its interior system toward the Pacific and the Atlantic, and the double tracking and branch building of the Canadian Pacific Railway. There is still great activity in the carrying out of these railroad programmes. The Canadian Northern is now working on the long section across the Rockies. The Grand Trunk Pacific is also getting its mountain section farther advanced, and the Transcontinental Railway Commission is getting the gaps between its completed sections fewer and narrower. In a short time the Government will begin in earnest upon the construction of the Hudson Bay Railway, the route for which is already surveyed.

Railroad building in Canada is still very active, and will be throughout the whole of 1911, in which year it is expected there will be as much capital applied on this account as there was in 1910. There is at least $100,000,000 of capital in hand for extensions and improvements of existing lines in 1911, to say nothing about capital that may be raised in the same account in that year.

New Transportation Projects

Three other huge transportation projects are promised by the Dominion Government. These, however, are for waterways. They are the improvement of the Welland Canal, the construction of the Ottawa and Georgian Bay Canal and the canalization of the Saskatchewan River. The first two will, it is estimated, cost $200,000,000. The third will also be extremely costly.

To the last-named undertaking, the premier, Sir Wilfrid Laurier, strongly pledged his Government in several of the speeches he made in the course of his summer tour of the West. That and the Hudson Bay Railway he promised to set about very soon, and he assured the grain growers of his government's purpose to proceed with the Ottawa and Georgian Bay Canal in the near future. A few weeks ago he was waited on by two very large deputations of delegates from Boards of Trade, the one urging action in regard to the reconstruction of the Welland Canal, and the other with regard to the Ottawa and Georgian Bay Canal. He gave rather positive answers favorable to the enterprises.

There is no doubt that it is the Government's intention to go on with these works with the least possible delay, Sir Wilfrid Laurier expressing the hope that the reconstruction of the Welland Canal would be begun within the present fiscal year. That improvement means no less than the construction of a new Welland Canal large enough to accommodate vessels requiring upward of 20 ft. draft. The depth will be not less than 25 ft. The locks will be correspondingly large.

The Spirit of Construction Abroad in the Land

But though railroad building has continued on a very large scale, and though great new transportation undertakings are to follow the large ones now in a forward state, it is no longer solely upon works of this kind that capital is being fixed on an enormous scale. There is now a very large amount of new capital being widely diffused and applied in a diversified way. Hundreds of millions of dollars are every year being turned into land, mines, timber limits, factories, office buildings, dwellings, bridges, roads, pavements, power developments, electrical plants, water works, machinery and equipment of all kinds.

This new capital, which is being transformed into productive instrumentalities, is not by any means altogether the accumulation of Canadian thrift and Canadian profits. On the contrary, it is for the most part the money of British investors. Backing the spirit of enterprise in Canadian and American promoters of industry here, British investors are furnishing the money for the great construction and reconstruction in progress in every Canadian city, every live Canadian town, and at places which a short time ago were no more than railroad town sites. There is some reason to fear, indeed, that the ease with which some of the municipalities and other borrowers are getting money is making them careless as to their use of it, and this may some day cause a reaction and a tightening of British purse strings. Though Lloyd George gets probably more condemnation than commendation from Canadian newspapers, it cannot be denied that, if he is scaring capital out of the United Kingdom, much of it is seeking asylum in Canadian investments that are proving very fruitful elements in the development of the country's resources.

The United States Contributing

For its present era of development Canada is also much indebted to men of enterprise in the United States, who in many cases take the initiative in opening up this or that center of natural resources, and in giving utility to this or that potential wealth. An enormous amount of American money has in this way and in the form of branch factories been transferred to the Canadian side of the border.

The great fact to be noted by all who take a commercial interest in Canada is that there is now going on here a vast amount of foundation work financed, for the most part, by British capital which never before was so unstintedly supplied for Canadian use as it has been in recent years. This foundation work will be the basis of permanent activities that will maintain large business operations. It will count tremendously in the making of the country. If this year the country is favored with good crops the forward movement in Canada will receive new impulses from British capital, from well to do immigrants and from new trade relations.

C. A. C. J.

The Massachusetts Institute of Technology Desires More Liberal State Aid.—Richard C. MacLaurin, president of the Massachusetts Institute of Technology, has drawn up a strong argument, making a pamphlet of 12 pages, urging a large increase in State aid to the institute. He gives the history of its establishment and says it was "the first school to equip a mining and metallurgical laboratory for the instruction of students by actual treatment of ores in large quantities; the first to establish a laboratory for teaching the nature and use of steam, and a laboratory for testing the strength of the materials of construction in commercial sizes; and the first in America to establish a department of architecture. It was also the first in this country to set up distinct and separate courses of study in electrical engineering, in sanitary engineering, in chemical engineering and in naval architecture." The needs of the institute are clearly set forth.

New Railroad Equipment.—The St. Louis Southwestern has placed its order for 1500 box cars and 500 furniture cars with the American Car & Foundry Company. The Baltimore & Ohio is reported to have divided an order for 1000 cars equally between the American Car & Foundry Company and the Haskell & Barker Car Company. The Vandalia is inquiring for 150 freight cars. The Great Northern, in addition to its recent order for 500 cars, has placed 400 hopper cars with the Haskell & Barker Car Company. Recent locomotive orders include 10 from the Seaboard Air Line for the Baldwin Locomotive Works. The Pittsburgh & Lake Erie is reported in the market for 24 locomotives.

The New England Foundrymen's Association

The annual meeting of the New England Foundrymen's Association, at the Exchange Club, Boston, January 11, was made a memorable occasion by the presence of a large delegation of fellow foundrymen from Philadelphia and other Pennsylvania cities, Baltimore, Newark, N. J., and Wilmington, Del. The meeting was the largest in the local association's history, some 200 members and guests enjoying the dinner and the excellent after-dinner speaking. At the business meeting these officers were elected: President, Herbert E. Wetherbee, James Hunter Machine Company, North Adams, Mass.; vice-president, Charles L. Newcomb, Deane Steam Pump Company, Holyoke, Mass.; treasurer, George H. Lincoln, G. H. Lincoln & Co., Boston; secretary, Fred F. Stockwell, Barbour-Stockwell Company, Cambridge, Mass. Executive Committee: Robert C. Bird, Broadway Iron Foundry, Cambridge; C. A. Reed, Hickman, Williams & Co., Boston; J. C. Hosford, Magee Furnace Company, Boston; Charles L. Nutter, Old Colony Foundry Company, East Bridgewater, Mass., and F. W. Stickle, Capitol Foundry Company, Hartford, Conn. M. A. Hanna & Co., Cleveland, and the Carborundum Company, Boston, were admitted to membership.

Henry A. Carpenter, Providence, R. I., was the toastmaster, and the speakers included Mayor John F. Fitzgerald of Boston, Thomas Devlin, president of the Philadelphia Association, and Howard Evans, its secretary; Dr. E. E. Brown, Philadelphia; Dr. Wilmer Krusen, Lebanon, Pa.; Col. H. Anthony Dyer, Providence; Hon. Geo. W. Gardner, Collector of the Port of Providence, and Carlisle Mason, Philadelphia. A male quartette and an orchestra furnished music during the dinner.

The visitors included the following from Philadelphia: Thomas Devlin, Thomas Devlin Mfg. Company; E. E. Brown and C. R. Brown, E. E. Brown & Co.; Josiah Thompson, J. Thompson Company; J. H. Sheeler, Sheeler-Hemsher Company; Carlisle Mason, Nelson Valve Company; J. I. Fasey, Philadelphia Chaplet Company; Frank Krug, Joseph Dixon Crucible Company; George C. Davies, Pilling & Crane; John Alexander, Harrison Safety Boiler Works; Howard Evans and A. W. Warren, J. W. Paxson Company; H. M. Plitt, Plitt & Co.; C. E. Bertie, Rogers, Brown & Co.; N. Ayers; W. W. Parry, American Pattern Company; L. U. Parke, Naylor & Co.; Oliver Gee, Matthew Addy & Co.; Wilfred Lewis, Tabor Mfg. Company, and W. B. Robinson and A. A. Miller, *The Iron Age*. Others of the party were: R. S. Buch, A. Buch's Sons Company, Elizabethtown, Pa.; R. A. Talmie, Lobdell Car Wheel Company, Wilmington, Del.; J. S. Stirling, Hilles & Jones Company, Wilmington; Mr. Barlow, Newark, N. J.; D. T. Jones, Wilbraham-Green Blower Company, Pottstown, Pa.; Dr. Wilmer Kruson, Buchanan Foundry Company, Lebanon, Pa.; W. H. Ridgway, Craig Ridgway & Sons Company, Coatesville, Pa.; H. D. Harvey, Monarch Engineering & Mfg. Company, Baltimore.

Our Foreign Trade Makes a New Record

The record of foreign trade of the United States in the year ended December 31, 1910, as reported by the Bureau of Statistics, Department of Commerce and Labor, shows larger imports than in any preceding year, larger exports than in any year except 1907, and a larger total of imports and exports combined than ever before.

The total value of imports for the year was $1,562,807,622, against $1,475,520,724 in 1909. The exports were $1,864,411,270 in 1910, against $1,728,198,645 in 1909, and $1,923,426,205 in 1907. Imports and exports combined amounted to $3,427,218,892, which exceeded by about $80,000,000 the former high record year, 1907. The excess of exports over imports was $301,603,648, against $252,677,921 in 1909.

Over $200,000,000 worth of iron and steel manufactures were exported from the United States during the calendar year 1910, a larger total in value than in any earlier year. The largest exportation prior to 1910 was $197,000,000 worth in the calendar year 1907, while in 1902 the total was $98,000,000, and in 1903 $99,000,000, thus indicating that the exports of 1910 will be more than those of 1902 and 1903 combined. The total value of all manufactures, including those of iron and steel, exported during the calendar year 1910 aggregated about $830,000,000. Iron and steel manufactures form in value nearly one-fourth of the exportation of manufactures of all kinds. In addition to this large exportation to foreign countries the shipments of iron and steel to Porto Rico, the Hawaiian Islands and Alaska aggregated about $12,000,000.

December exports were valued at $227,155,049, being larger by $20,000,000 than in any other month in the history of the export trade. The December imports were slightly greater than those of November, but slightly less than those of December, 1909.

Molders' and Stove Founders' Conference

A full report of the annual conference between representatives of the Stove Founders' National Defense Association and the International Molders' Union of North America, held at Chicago in December, is given in the *International Molders' Journal* for January. The meeting brought out some very sharp differences and it seemed at times that no agreement could be reached. However, an advance of 5 per cent. on present molding prices was agreed upon, making 30 per cent. on board prices instead of 25 as heretofore. It was agreed that sections where a different percentage has been paid will pay an equivalent advance. The advance applies to all stove and furnace molders, including day workers, and any new device upon which a molder is employed. The question of hours caused a long discussion. The agreement reached was that on and after April 1, 1911, the last ladle of iron will be given to the molder within one and three-quarter hours after the seven hours of molding.

For several years the question of dirty iron has been agitated by the representatives of the Molders' Union, who claimed that the molders were not responsible for work lost from this cause. On the other hand, the stove founders have contended that the fault was with the molders and that the bad work was due to careless pouring. The discussion on the subject at Chicago brought out the usual differences of view, but it was finally decided that where there is an abnormal loss of work in particular cases, the secretary of the Stove Founders' Association and an officer of the Molders' Union must promptly take the matter up, and where investigation shows that the work is lost through no fault of the molder he shall be paid in full.

The issue raised over molding machines was considered at length. The stove founders claimed that their members had never been able to operate a machine with a molder because of the construction put upon the agreement on this subject by officers of the Molders' Union. The latter insisted that the expert who was to make a pace for machine molding prices must come into the shop a perfect stranger and that the first day's work should be used to determine the price. The stove founders' understanding was that an expert could be employed for any length of time, so as to become familiar with the work, and when ready to make a demonstration would then put up a day's work, using that as the basis for a price fixing. Assurances were given from both sides that a more liberal construction would be put on the clause relating to molding machines, and it was agreed that an immediate effort be made both by the firms and the molders to price all work now made on molding machines. It was agreed that the normal output of the machine must be taken into consideration and a demonstration made whenever this is necessary. When the firm and the Price Committee disagree the question must be submitted to the officers of the two organizations for adjustment.

The Empire Shipbuilding Company, Buffalo, N. Y., has been awarded contract for the construction of a twin screw steel passenger steamer, 210 ft. in length, for the Buffalo & Fort Erie Ferry & Railway Company.

Standards of Efficiency in Shop Operations*

How the Compensation of the Employee Should Be Determined—The Element of Justice in Scientific Management

BY HARRINGTON EMERSON.

Unforeseeable fluctuations in cost, uncertainty as to cost may ruin a manufacturer. Piece rates have, therefore, in many instances, been insisted on, not from any desire to underpay the worker, but to substitute certainty for uncertainty. Nevertheless, whatever the original motive, the result generally is that a manager having freed himself from worry about the way the worker is putting in his time, has himself more time to worry about the amount the piece rater is earning. The manager starts out by saying that the worker is not giving him enough for the $3 paid a day, only five pieces, so he puts him on piece rate, based on what the manager thinks is a fair cost, say, $0.30 a piece for 10 pieces a day. The worker hustles, standardizes conditions and operations, gets out 15 pieces a day, and the manager is horrified to find he is earning $4.50 a day and forthwith tries to cut the piece rate to $0.20. The worker resents this, but in the long run he is helpless. He may stand pat on his production and refuse to do even what is reasonable. This would work if he were alone, but there are others who will not stand pat. He may even fight against a manifestly just reduction in rate, as when high speed steel was introduced. In the end, in old established industries, men and women are speeded up beyond health and justice. I have known men in one of the largest concerns in the country, a well managed concern, to come to work at 4 a.m. because otherwise at the prevailing piece rates they could not make adequate wages. I have seen girls produce 60,000 pieces a day, month after month and year after year, until vitality was sapped.

In both these establishments for many years that abominable, iniquitous plan had been pursued of setting a mental limit to earning power, of holding out the bait of piece rates, of keeping tab on maximum performance, of dividing maximum output into preconceived wage rate and utilizing every opportunity to cut the price. In one great plant when I was checking over piece rates, I said: "Your piece rates are evidently very unscientific, since the same man earns one week $25 and another week $40." "Not at all," said the manager, "you do not understand the scheme. The normal wages for these men is $30 a week, but by the occasional bribe of $40 we run them along at $25. They only average in pay $28. Their pay is really $2 a week below what they are entitled to and would receive were it not for our plan."

There may be honest and fair piece rates, but I have never encountered them, and the influences are all against them when an interested party sets both time and price.

Not 50 years ago we abolished human slavery, only five years ago I heard the general superintendent of a great concern boast that he took boys, whose parents supposed they were to learn the trade, placed them in front of a machine, stationed for a few days a teacher behind them who held their wrists and manipulated their hands until the boy could do automatically the repeated job as fast as the machine could work. The superintendent boasted that he got as much out of a $0.10 an hour boy as out of a $0.30 machinist.

Only a few days ago it was reported that the Carnegie Company in Pittsburgh was trying to break up the practice of certain bosses and foremen who regularly levied blackmail on those under them, each applicant for work paying a cash bonus to be put on a job and paying a commission each week on his wages.

* Extracts from an address on "Justice, Common Sense and the Pay Roll," delivered at the New York meeting of the National Civic Federation, January 12, 1911.

Compensation on a Just Basis

All this shows that two elements enter into compensation: First and all important is the moral element; secondly, and less important, the method.

Made wary by all the abominations of the past, I mistrust self-interest whether in employer or employee. I desire to see both adopt a method of compensation that will reduce the opportunity for injustice to a minimum, yet benefit them both.

I, therefore, do not submit any method or device for paying wages, but certain principles in the hope that they may be discussed in the spirit in which they are proposed. They are intended to substitute justice for selfishness, co-operation for antagonism, certainty for uncertainty, economy for wastefulness—moral aims every one of them. If I were permitted to apply these principles to a large shop it would not be necessary to discharge a single man, nor to decrease his hours or lessen his wages. I would compel no man to work any harder than his inclination and I would discourage excessive effort. Every man would receive higher and higher wages year after year, simply because he stayed, each man at the end of service would receive service pension, the average earnings per hour per man would be much higher than elsewhere, the labor costs per unit far lower, the output be increased probably threefold, giving employment to a greater number of workers, the total unit cost greatly reduced, all operating costs would be accurately and reliably predetermined not only before work was begun, but long in advance, say, 12 months. Not having to fight and cheat each other, workers not having to worry about their positions, nor managers having to worry about cost uncertainty, both could put in more gray matter eliminating unnecessary and, therefore, wicked waste. The happiness and morale of the whole shop would be very high.

Principles of Efficiency

To begin with the last assertion, the morale and happiness of the shop. Before even considering the subject of the worker and his pay, I would be prepared to apply through a competent form of organization the 12 principles of efficiency, which are:

1. Definite plans and ideals.
2. Supernal common-sense.
3. Competent guidance.
4. Discipline.
5. The fair deal.
6. The dispatching of work.
7. Reliable, immediate and adequate records.
8. Determination of standards.
9. Standard practice instructions.
10. Standardized conditions.
11. Standardized operations.
12. Efficiency rewards.

Every proposition, every plan, every method and device that runs counter to any one of these principles is to be rejected without further waste of time. Accepting the principles I would plan as to

The Worker and His Pay

The first essential for success and happiness in a working life is that the worker shall like his work and be competent to do it. It is as great a disaster for a boy to start in a trade for which he will never have liking, in which he will never be able to excel, as it is for a girl in early womanhood to make an unsuitable marriage. In either case it generally means a shipwreck of life. There should be a protected shop, a shop closed against any not anxious and fitted to work in it, a shop into which

it would be a coveted privilege to enter, a shop it would be a catastrophe to leave.

The basic rate of wages should be for each trade the current rate of the district and time. The basic scale may from time to time have to be modified. Scarcity of labor may force it up, lower wages elsewhere may force it down; it is the most delicate of all wage questions, and it will be years before it can always be peacefully settled.

Standard Cost of Work

Whatever his real costs may be, a manufacturer is entitled to know what his standard costs are. He must know the quantity and quality of his materials, the quantity and quality of his supplies, the quantity and quality of labor required, the quantity and quality of equipment required. He must know the cost per pound of his materials and supplies and the amount that he must use, he must know the standard wage rate per hour for the operation and the hours required to do it, he must know the cost of equipment charges per hour and the hour's equipment is busy. The wise shop manager must therefore determine time equivalents for all operations. This necessity, this obligation to determine standard and actual costs has no direct connection with any method of paying or varying wages. Having determined time standards he will exert himself to the utmost to make them easy of attainment. He will see that the shop is hygienic, safe, comfortable, well lighted, that machines and tools are maintained in first-class condition, that work is abundant and always ready for the man, that castings are not too hard, that crane and other helper service is prompt. The wise manager will in addition have both ears open for every suggestion coming to him from those closer to the work than he is. The blue prints and other instructions and directions will be plain; there will be shop standards of high and decent excellence.

In such a shop it would not be possible for the following to happen—a record of actual experience. A piece of steel about the size of a visiting card was on a shaper. Although 1¼ in. would have been sufficient, the stroke was actually over 4 in. The speed of the stroke was exceedingly slow, not more than one-third of what it ought to have been. The tool had a diamond point, and was taking off 1-32 in. each stroke when a round-nosed tool could easily have taken one-eighth. The operator took in succession four cuts, each a mere film, when one rough cut and a scraping finishing cut would have answered. The total efficiency of the operation was 1.25 per cent. This operation was taking 80 times as long as it should. It is to call the attention of all concerned, from worker up to manager, to losses of this kind that standards and instructions are required. The worker was not vicious, he had simply not been told, he had no incentive to think. A standard cost statement will show where every inefficiency occurs. There are 12 different inefficiencies, and only one of them is due to the worker; the other 11 are due to the managers.

In determining a rational standard of speed or endeavor for the worker the scientific expert knows that there is a speed which is a pleasure and a joy, a right speed, also a slow speed that is killing by its dullness and a fast speed that is killing by its strain. When thousands of workmen rode on their bicycles to their work, was there not an average speed voluntarily adopted as more pleasant? It was not 5 miles an hour, it was not 20 miles an hour, but somewhere between 10 and 15 miles, according to the wind, path, grade and personal feeling.

Costs should be standardized by those who are qualified. The manager cannot arbitrarily set standards, his work is cut out for him in eliminating the 11 inefficiencies for which he and not the workers are responsible, and when it comes to doubt as to standard time set for cost determination, if I were a manager, I would be willing to refer the question to an arbiter qualified by long experience with the conditions, machines and work to pass on the reasonableness of the time set. It has been my experience with committees of the shop men that they were usually not lenient enough, that they did not sufficiently consider all the causes that might lengthen the time that they insisted on times too short, therefore I prefer a competent, disinterested arbiter.

Promotion and Efficiency Reward

I have spoken of a basic wage for each trade. The same basic rate for every hour of a whole lifetime is a hopeless kind of outlook. Everybody else can improve his condition. A permanent fixed rate is a relic of status, one of the slimy traces of slavery. In my shop there would be variations above and below the basic rate, an apprentice rate below base the man who had served his time would receive the basic rate, but after three or five years with added years of service would come an addition to the hourly rate. The amount of the increase I cannot state. Possibly the basic rate might double in 40 years. It is for a principle, not for a specific amount I am contending. A man who has worked long and well in a plant has acquired a special value which can economically be recognized. Promotion is, however, not to be limited to a small advance in pay with increasing years. For a competent, steady man there ought always to be promotion into a higher rank with corresponding higher pay. Scientific management requires fewer elementary workers, more high class workers, so the side chances of promotion are increased.

There is yet a third form of promotion, one of efficiency reward, the most important of all. Some bicycle riders prefer a 15-mile gait, others a 10-mile gait, as a matter of personal pleasure. There are men whose pride it is to work fast and accurately; there are other men who hate insufficient effort. If there are standards scientifically set, reasonable, attainable standards, if a man will act as his own foreman, it is proper that the continuous attainment of standard should be individually rewarded. If a man does less than standard he is neither blamed nor discharged; if he does more than standard, all the time he saves should be paid for at full rate, and in a plan I have often recommended, between 10 miles an hour and 15 miles an hour, to use this as an example, he is given an increasing individual reward.

Fifteen miles is reasonable but not compulsory. At 10 miles he receives full wages per hour, let us, say, $0.30, but at 15 miles he receives $0.36, and if he chooses to ride 18 miles he receives for his hour 0.42.

In a well-organized shop under this system, with over 800 workers, no new man was admitted who was not at least capable of riding 10 miles an hour, and while most of the workers showed efficiencies between 80 and 120 per cent., there were some as low as 30 per cent. There was one who attained 200 per cent. It was his choice, his pleasure never to make a false move, to work with both hands at once, and it never entered the manager's head to raise the standard because this man was a marvel of his class.

Another job had been standardized at 0.9 hours or 54 minutes. A master machinist did it regularly in 51 minutes, and was ultimately promoted to a foremanship. An apprentice in his last month replaced him, and did 1296 pieces in 24 minutes each. He was a wonder to watch. His phenomenal time, high earnings and consequent low cost prompted an investigation. The work was most carefully time studied, and it was the unanimous verdict that the standard time of 54 minutes should stand, as there was probably not another man in the world who could do the work in 24 minutes. In this shop and under this system no one was paid by the piece or given a bonus for any individual job. He was given a bonus proportionate to his average monthly efficiency if it exceeded two-thirds of the time standard.

The last volume of the *Proceedings* of the Master Mechanics describes a fireman who shoveled in 1 hour 2088 lb. of coal. The locomotive smoked, the pop valve hissed, water and fuel, money and effort were being needlessly wasted. The next hour the locomotive did more work, but there was no smoke, no escaping steam, the fireman shoveled only 720 lb. of coal. He had performed only one-third as much manual work, but he had backed up his muscle with thought and intelligence. He deserved higher pay.

Results of Efficiency Management

Efficiency management, therefore,

1. Selects men who will find pleasure and delight in their work.

2. It guarantees them a basic hourly rate.
3. It gives them higher pay from year to year.
4. It pensions them at the end of service.
5. It gives them many opportunities for promotion.
6. It establishes scientifically the 12 elements of standard cost and puts it up to the manager to eliminate the losses due to 11 of these elements.
7. It gives graduated efficiency reward to every worker from apprentice boy up to president.

This system puts responsibility where it belongs, sets no definite tasks, encourages no special stunts, does not reward specifically special stunts.

It is evident that if there are 12 different items of cost and that 11 of them can be lessened by scientific management, it must be for the purpose either individually or collectively of increasing human welfare, of paying more to the workers per hour. There is no possible escape from this conclusion. The public may receive all the benefit of waste elimination temporarily, financial backers may appropriate more than a fair return, but the men of all others who deserve immediate recognition are those who direct and do the work, who aid in waste elimination. Therefore, under the efficiency system the public may profit by lower prices, sellers may profit because of greater output and lower overhead charges, but first and foremost the man who has substituted brain activity for muscle activity ought to receive increased pay.

The Standard Oil Company's Tin Plate Purchase

The recent buying of American tin plates by the Standard Oil Company, as noted in *The Iron Age* of January 12, and the great strength in the British tin plate market, are commented upon in London trade journals. The total of the Standard Oil Company's late purchases from domestic producers is 260,000 boxes, 200,000 boxes for the trade in which drawback plates have been used and 60,000 boxes for direct export. The London *Ironmonger* of January 7 says of the British tin plate situation:

"The tin plate market continues to show unabated strength, and very high prices are being paid where buyers require prompt deliveries. The demand is of an all round character, and the trade seems to be on so firmly established a foundation that makers become more and more independent from week to week. As much as 16 shillings has been paid for quarters for prompt delivery, but it is hard to get supplies even at that figure. Some of the shortage in prompt deliveries seems to arise from the fact that certain works have sold the output of their new mills and, being unable to get anything like a proper return from them, have been unable to deliver, and buyers have had to purchase against them. The bulk of the business passing, however, is for July-December, Liverpool interests, it is reported, being particularly active buyers. Some very extreme figures are asked by the most independent works even for far forward deliveries. For instance, while 28 shillings 6 pence to 29 shillings, f.o.b. Wales, is very generally asked for 20 x 28 plates for delivery up to December next, we hear of actual business at 28 shillings 1½ pence, July-August-September, f.o.b. Swansea. There is an excellent demand for light wasters for Japan. Makers continue to experience the utmost difficulty in securing adequate labor. The Standard Oil Company is reported to have booked 200,000 boxes with the United States Steel Corporation for January-February-March. It is rather fortunate for the buyer that it was able to place the business in the United States, for it certainly could not have secured anything like this quantity for early delivery from Welsh makers."

The United States Radiator Corporation has decided to move the general offices of the company from Dunkirk, N. Y., to Detroit, Mich.. The company has an office force of 150. The legal headquarters of the company for the election of directors and the meetings of the stockholders of the corporation will continue to be in Dunkirk. F. W. Herendeen has been elected a director to fill the vacancy caused by the death of his brother, E. G. Herendeen.

Iron and Steel Production for Twenty-Five Years

The accompanying chart shows in a graphic way the expansion of iron and steel production in the United States in the past 25 years. It was prepared particularly to indicate, much more vividly than is possible by the use of figures merely, the quantitative relation of the important forms of product—pig iron and steel ingots; then the relation of open hearth to Bessemer steel, and finally, the percentage of steel ingots which enters into rails. The approximation of the steel ingot output to that of pig iron is the most marked feature of the diagram. In the first six years covered by the exhibit the pig iron production averaged more than twice that of steel. Then for six years it averaged about 50 per cent. more. The course of the two lines after 1897 was due not simply to the fact that steel became increasingly prominent, but to the fact that basic open hearth steel made a phenomenal advance, and hence the steel tonnage received a strong reinforcement from the use of old material. It will be seen that in the past five years the production of steel has averaged only about 2,000,000 tons a year less than that of pig iron.

Another feature of the plotted lines will attract attention—the close parallelism, through about half the period, of the line for total steel ingots and that for Bessemer ingots. As the open hearth steel line grew steeper the interval between total ingots and Bessemer ingots widened. Then came the long predicted crossing of the open hearth line to the upper side of the Bessemer line, followed in 1908 by the descent of the latter at a more acute angle than that of the open hearth, and in 1909 by a much sharper ascent of the open hearth than the Bessemer line.

The steel rail production is plotted chiefly to show how relatively unimportant is its percentage of the total output of steel, and how much greater this percentage was in the first half than in the second half of the chart period.

The position of the pig iron line for 1910 is already quite closely determined, and it is, therefore, plotted on the chart. The line for total steel ingot production as it crosses the last space on the chart will probably parallel closely that for pig iron, indicating for 1910 an output slightly above 25,000,000 tons. The open hearth and Bessemer lines will probably have a slight slant upward, while that for rails will be nearly horizontal, though terminating at a point slightly above the 3,000,000-ton mark. The production statistics for the period covered by the chart are as given in the following table:

Production of Pig Iron, Steel Ingots and Rails for the Past 25 Years.—Gross Tons, 1 = 1000.

	Pig iron. Thousand tons.	Total steel ingots. Thousand tons.	Bessemer ingots. Thousand tons.	Open hearth ingots. Thousand tons.	Steel rails. Thousand tons.
1886.....	5,683	2,562	2,269	218	1,579
1887.....	6,417	3,339	2,936	322	2,119
1888.....	6,489	2,899	2,511	314	1,390
1889.....	7,603	3,385	2,930	374	1,513
1890.....	9,202	4,277	3,688	513	1,871
1891.....	8,279	3,904	3,247	579	1,298
1892.....	9,157	4,927	4,168	669	1,541
1893.....	7,124	4,019	3,215	737	1,130
1894.....	6,657	4,412	3,571	784	1,017
1895.....	9,446	6,114	4,909	1,137	1,300
1896.....	8,623	5,281	3,919	1,298	1,117
1897.....	9,652	7,156	5,475	1,608	1,645
1898.....	11,773	8,932	6,609	2,230	1,977
1899.....	13,620	10,639	7,586	2,947	2,271
1900.....	13,789	10,188	6,684	3,398	2,384
1901.....	15 878	13,473	8,713	4,656	2,872
1902.....	17,821	14,947	9,138	5,687	2,941
1903.....	18,009	14,534	8,592	5,829	2,991
1904.....	16,497	13,859	7,859	5,908	2,283
1905.....	22,992	20,023	10,941	8,791	3,375
1906.....	25,307	23,398	12,275	10,080	3,977
1907.....	25,781	23,362	11,667	11,549	3,632
1908.....	15,931	14,023	6,116	7,836	1,920
1909.....	25,795	23,955	9,330	14,493	3,023
1910.....	27,275*	....	....	....	....

* Estimated.

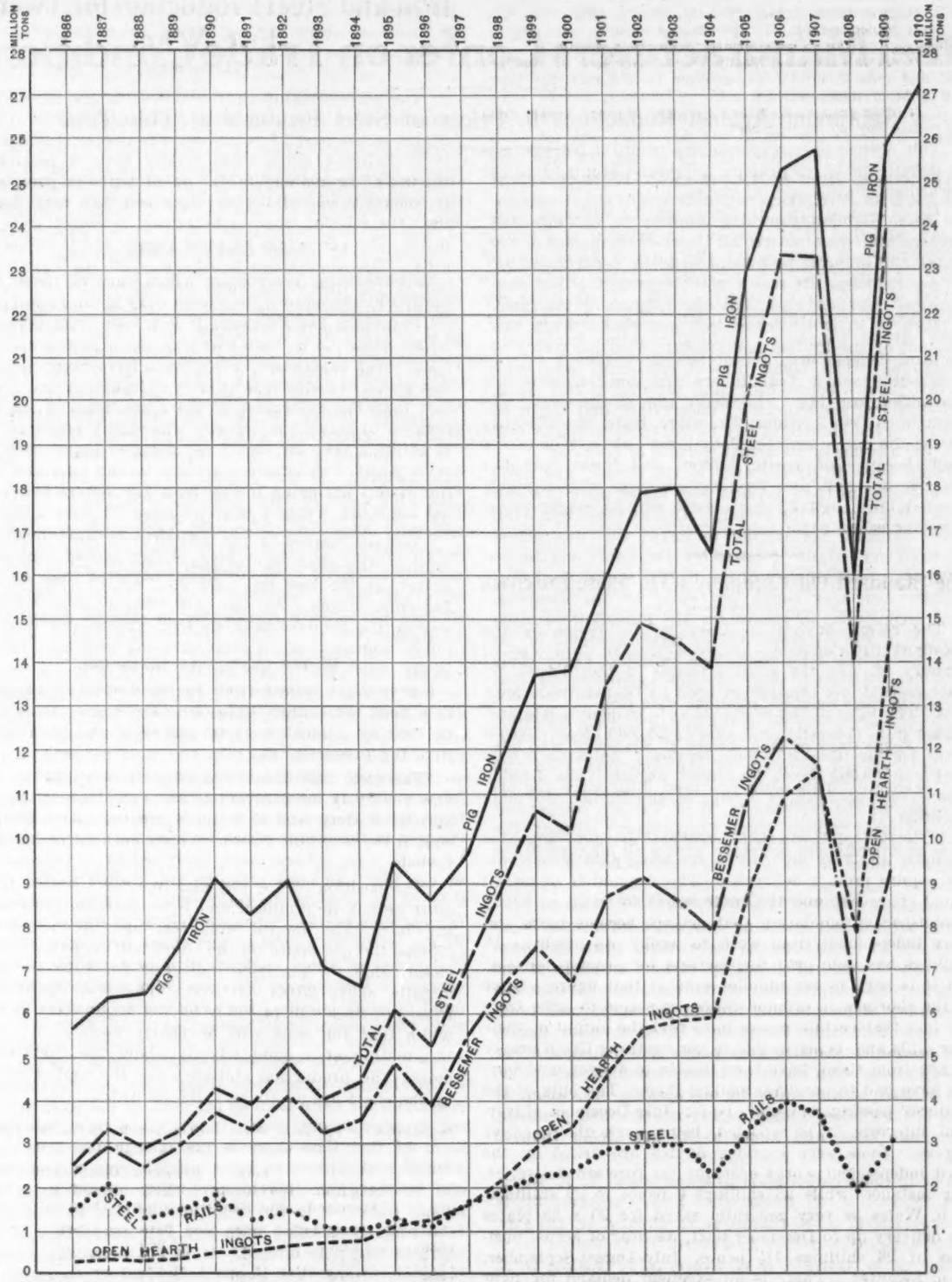


Chart of Production of Iron and Steel in the 25 Years 1886-1910.

The Tariff Commission Convention

The Tariff Commission Convention held at Washington, D. C., January 11 and 12 was an enthusiastic gathering of men prominent in varied branches of commercial and industrial activity. Numerous addresses were delivered in favor of a permanent Tariff Commission. Among the speakers at the banquet on the evening of the 12th was President Taft, who openly indorsed the Longworth bill, making a strong argument in its favor. Henry R. Towne, president of the Yale & Towne Mfg. Company, delivered an able address on this occasion, in which he demonstrated the great necessity of departing from the time honored but unsystematic method of tariff revision. He said in part:

As in engineering and modern industrial development facts have replaced empirical beliefs and rule of thumb practice, so in the tariff, which vitally affects all industries directly, and all other interests indirectly, we need and should have a basis of solid facts on which to build. It will be the function of the Tariff Commission to ascertain the essential and underlying facts, for the information, use and guidance of Congress. In this regard the issue has been misunderstood and befogged. Under the Constitution only Congress can legislate. It cannot and should not delegate this power and responsibility. The functions of the Tariff Commission will be closely analogous to those of a commissioner, appointed by a court to take evidence and to make findings of fact based thereon. On these findings, so reported, the court, or in this case the Congress, bases its decision and decree.

The convention unanimously adopted a resolution demanding of Congress the passage at the present session of legislation creating a permanent Tariff Commission "having functions and compensation analogous to the Interstate Commerce Commission." A resolution indorsing "the proposal of President Taft that hereafter the work of tariff revision, whenever required, shall be accomplished schedule by schedule, or, preferably, subject by subject," was also passed unanimously.

Steel Manufacturers Confer on Trade Conditions

Sentiment Against Reductions in Prices of Steel Products at This Time

The dinner given by Chairman E. H. Gary of the United States Steel Corporation at the Waldorf-Astoria, New York, Wednesday evening, January 11, was attended by representatives of nearly all the steel companies of the country and of firms prominent in other departments of the iron industry. It was a notable gathering, not only because so representative, but also because of the interest taken in it by buyers of iron and steel. While the sentiment of the leading manufacturers on the policy of maintaining prices under present conditions was quite generally known before they came together in New York, there was just the amount of uncertainty that might be expected in the absence of any formal declaration, as well as in the absence of an actual canvass of opinions.

There were 90 participants in the dinner, and more than one-third of those present were called upon to speak in the latter part of the evening. One of these was John G. A. Leishman, Ambassador to Rome, who was seated at Judge Gary's right. Next to Mr. Leishman was James A. Farrell, president-elect of the United States Steel Corporation, who was called out early in the speaking. Strong expressions of regard for Mr. Farrell were made by many of the speakers, and of warm approval of his selection. In the same connection President Corey came in for commendation from various manufacturers who referred to their business relations with him.

An interesting feature of the dinner was the introduction by Judge Gary of Hon. James T. McCleary, who has just been elected secretary of the American Iron and Steel Institute. This office has been filled since the organization of the Institute by W. J. Filbert, comptroller of the United States Steel Corporation, pending the choice of a permanent secretary giving all his time to the work.

Expressions Concerning Prices

The after-dinner speaking was quite informal. Some of those who made remarks were called upon by Judge Gary, others were called out by various members of the company. The expressions of the manufacturers on the advisability of maintaining present prices for steel products were uniformly favorable. In some cases figures were presented, showing that prices now ruling are low in comparison with those of other recent periods. The level of 1907, it was stated by one speaker, was about $7 a ton above that of to-day on important rolled products, apart from rails, and wages to-day are higher than in 1907.

Among those called upon to speak were: L. E. Block, W. L. Brown, J. G. Butler, Jr., J. A. Campbell, H. S. Chamberlain, E. A. S. Clarke, A. C. Dinkey, H. Du Puy, B. F. Fackenthal, Jr., J. A. Farrell, E. C. Felton, A. I. Findley, T. W. Guthrie, E. G. Grace, A. F. Huston, O. N. Hutchinson, J. H. Hoyt, I. A. Kelly, Willis L. King, Samuel Mather, Geo. W. Perkins, Veryl Preston, Chas. S. Price, H. F. Perkins, David Reeves, W. A. Rogers, James R. Roe, I. M. Scott, W. P. Snyder, Powell Stackhouse, C. J. Stark, John A. Topping, Geo. M. Verity, F. S. Witherbee, F. W. Wood, and W. P. Worth. A cablegram sent from London by Charles M. Schwab was read. It said: "Hope each will see advisability of maintaining present situation, as I believe active demand at hand and change will delay."

Following the dinner Judge Gary gave out the statement below:

"The dinner of the evening, given to the leading steel manufacturers of the country, was largely a social event. Many different topics were referred to by the various speakers. However, the subject of prices was more or less referred to, and without exception the opinions were opposed to any reduction. Figures were given tending to show that the present prices of all steel commodities are not only reasonable, but very low. I do not think any reductions are contemplated. As to business prospects, the consensus of opinion as expressed was very favorable."

Judge Gary's Remarks

In introducing the subject which most of those who followed him touched upon, Judge Gary spoke as follows:

GENTLEMEN AND FRIENDS: It is a very great pleasure and happiness to be here this evening in your company. In my short experience in life there have been no occasions which to me have been more enjoyable in the truest sense than the enjoyment of these meetings. I am not prepared to make a set speech, although I ought to be; but before I take my seat I am going to make some remarks which I think are pertinent to our interests, and after that I am going to call on a few others to speak. I do not know whom I will call upon. I have made no selection. Every one of you is subject to draft, but comparatively few of you, in view of the limited time, will actually be called upon. It is not expected that we will have any formal addresses. No one will be blamed if he does not make a speech that is entirely satisfactory to himself.

A 95 PER CENT. REPRESENTATION.

I have many letters from members of our profession throughout the United States who are unable to be here this evening. Some of my friends here estimate that at least 90 per cent. of the iron and steel industry of this country is represented in this room. If those absent who have written to me expressing their confidence in us and their desire to co-operate with us and their hope that no changes in the course which we have been pursuing shall be made, were present here, there would be represented of the iron and steel trade in the United States more than 95 per cent. of the total. That, I think, gentlemen, is most remarkable. I believe that in no line of business in the world at any time has there been such a large percentage of those engaged in a business as the percentage in this country who are going along day by day, hand in hand, pursuing the same course, anxious to promote the welfare of all the others.

THE WAY TO DEMORALIZATION.

At this particular time there is not in this country a demand for more than 50 per cent. of the total producing capacity in our lines. It is obvious from this statement of fact that there is not enough business to go around, and that there is no possible way of protecting one another and thereby protecting oneself except to submit ourselves to the conditions as they exist, and to take and be satisfied with our fair proportion of the business which is offered. It is not necessary, in this presence, to say that if one individual or company engaged in this business tries to secure or actually secures for a day or a week more than a fair proportion it simply means that in the long run that man or that company gets no more than his share; he has accomplished nothing whatever except to bring about demoralization, reduction of prices and heavy losses to all concerned, including himself. This is a logical proposition. No man is smart enough to long continue a practice which gives to him more than his fair share of business. He may succeed in one trade, he may get away from his friend or competitor his customer for a single transaction or two transactions; but it is just as certain that the competitor whose business has been taken away will the next day or the next week enter within the domain of the one who has first trespassed, taking away his business and adjusting, equalizing, bringing about at the end of the year or at some definite period simply the natural division of business and at greatly reduced prices. And there is no exception to this unless it be the basis of the strong man or the strong company having the advantage over his

neighbors, and he gets the business only by means which result in forcing his competitor out of business, and in that way antagonizing the public interest and earning the condemnation, not only of the public, but of the very government itself. Therefore, it is impracticable.

HOW LEGALLY TO CO-OPERATE.

Now, in view of the fact that we have no right legally to enter into any arrangement by direct or indirect means which enables us to maintain prices, to divide territory, to restrict output, or in any way to interfere with the laws of trade or to stifle competition, and in view of the fact that we cannot legally directly or indirectly do anything which may be construed to be in restraint of trade, and, therefore, are relegated to the one position of treating each other on the basis of fair, just and equitable treatment, it behooves us to use the greatest care in the exercise of our rights and in the transaction of our business, so as to make it absolutely certain that day by day, and with reference to every transaction, we are certain to recognize the rights of our competitors, our friends, and the obligations which we are under toward them.

I say in this presence to men who know by long experience—men who know to a demonstration that what I speak is true and logical—that we have something better to guide and control us in our business methods than a contract which depends upon written or verbal promises with a penalty attached. We as men, as gentlemen, as friends, as neighbors, having been in close communication and contact during the last few years, have reached a point where we entertain for one another respect and affectionate regard. We have reached a position so high in our lines of activity that we are bound to protect one another; and when a man reaches a position where his honor is at stake, where even more than life itself is concerned, where he cannot act or fail to act except with a distinct and clear understanding that his honor is involved, then he has reached a position that is more binding on him than any written or verbal contract.

SUSPICION HAS GIVEN WAY TO CONFIDENCE.

In years gone by—and not many years since—many of us at least entertained toward others a feeling of suspicion, or, if not as bad as that, we certainly lacked entire confidence in one another. I know at the magnificent reception which you gave to one of your number a year ago last fall some of you were frank enough to say that even three years ago, when we met in this building under circumstances that were very uncertain concerning the future, you had feelings of doubt, if not of distrust, in regard to the real motive of the one who was bold enough to invite you to come together to discuss our mutual interests. And no doubt what was said at that time was true of many others who participated in the considerations of that eventful year, and that all of us to some extent had a feeling of distrust, or, at least, of doubt.

But I venture the assertion that there has been a change in this respect, and those in this room, particularly those who for the last three years have been coming into close contact with others, meeting them day by day, and having opportunity to know what was in the mind and what was the intention of his neighbor, have been forced to reach the conclusion that their competitors and neighbors were honest and fair minded.

Is it any wonder that such as I, coming a few years ago from another profession, having spent my time in other lines of activity, coming into this business without knowledge of it or acquaintance with those connected with it, groping along, in more or less uncertain paths, but eventually reaching the position which we have reached in our travels, so that we can have and do have absolute confidence in one another—willing to lay our business down upon the table for the inspection of our neighbors—is it any wonder that I should be elated, that I should be happy, that I should be proud of the fact that I am associated with such as you; that in representing the interests of a large corporation I can do business with so many men of prominence, education, experience, high standing and repute in the community, feeling all the time that I and the interests I represent are absolutely safe in your hands? It is a proud moment in my life, gentlemen. I cannot understand, I have not the vision to see why it is that you gentlemen have been so kind to me personally. But at the same time I have sufficient mental capacity to appreciate what you have done for and what you are to me and the high position you have put me in by the confidence you show in me when you come around the table at any time, from any distance, at my invitation, ready, willing and anxious to turn over to me and to my friends all that is in your mind and in your heart concerning your own business. And is it to be wondered that I take pride in this, that this is the greatest enjoyment in all my business life? And this is equally true of each of you, for you occupy the same position that I occupy.

THE MORAL OBLIGATION EMPHASIZED.

Why do I mention these things? From the abundance of the heart the mouth speaketh. These thoughts in my mind, in my heart, force expression. I deal in frankness. Why is it? Why are these thoughts in my mind? Why do they crowd into words? Because at this particular time I am anxious that no man around this table, no one connected with this business, shall, for a single moment, forget the high moral obligation he is under toward his neighbor; because if it was the last word I could have the privilege of saying to you, I would say with all my might and with all the emphasis that I could find words to express, I consider it of the highest importance at this particular time that every one of us should have a keen and abiding sense of the personal obligation which he has toward all others and to make no mistake of running the risk of trespassing within the domain of the rights of his neighbor, who has given his confidence and trust, and who is willing at all times to put within the knowledge of others, and therefore more or less under their charge and control, the very direction of his affairs.

I know, gentlemen, what human nature is, and I know also that there is no other line or branch of business kindred to our lines which occupies at present a higher position than ours. We are to some extent the subject of unjust attacks and of campaigns, originated and carried on for the purpose of creating dissensions in our ranks or to separate us one from the other or to make us suspicious, endeavoring to induce us to believe the charges that are made from time to time of the misconduct of our neighbors and to accept them as true and to act accordingly. We must all the time be on the alert. When we read in the newspapers or when we hear a report verbally from any source, even from our own subordinates, that our neighbors are not dealing justly by us, we must scrutinize the reports, we must receive them with caution and we must not adopt them unless we are assured they are reliable. And then before we act we must be certain to go frankly and promptly to the neighbor who is charged with wrongdoing and give him an opportunity to satisfy us in regard to the facts before we do him the injustice of deciding against him.

As I said recently, we have a disposition, an honorable instinct, which is calculated to take care of one another and therefore ourselves. Have we also the intelligence to manage our affairs in such a way as to make it certain that our business is not controlled by those who are inimical to our interests?

THE QUESTION OF MAINTAINING PRICES.

At the present time the question of maintaining or changing the prices of the commodities in which we deal is uppermost in our minds, because we read and hear about this question every day and almost every hour. I have been pained, I admit, from time to time to read in the newspapers that the United States Steel Corporation carried a big stick and was in the habit of inviting the independents, so-called, to come together for the purpose of lecturing them or, worse than that, of threatening them in case they proposed to reduce prices. I call upon you as witnesses to refute these insinuations. If it is just, if by my conduct or by my language I have induced any of you to suppose that I believe our corporation has any advantage or is disposed to take any advantage, or has intended to urge you to fix or to maintain prices

concerning your commodities which were not in accordance with your own views, I do not hesitate to ask your pardon. We make no claim for ourselves, except of the pride that we have in being your associates, and because you have given us your confidence and are willing to work with us. If any of you desire to lower prices at any time, and will make the fact known to me, you will find that I am a follower and not a stubborn opposer. I shall always beg leave to express my opinions in regard to what I think are fair prices, but I will do it not for the purpose of expecting you to adopt my views, nor for any purpose except the same purpose that you have in mind when you express to me your opinions. We deal in the open, we deal fairly and, as I have frequently said, you will always find me an easy mark. If a majority of you shall be of the opinion that I am making a mistake in advocating the maintenance of prices you will have no difficulty in getting me to change my opinion. And very fortunately the Finance Committee of our corporation, which determines the policy of the corporation, and which is made up of the biggest men we can get, are in accord with me concerning these views. They have always been willing to sustain me because they believe the positions taken are right.

Now my opinion is that it would be a mistake to reduce prices at this time; that it would do more harm than good; that instead of getting more business we would get less business; that the average purchaser, perhaps without exception, is not so much in favor of the reduction of prices as he is in favor of making it absolutely certain his prices are the same prices that another has to pay for the same commodity. And the only reason in the mind of the proposed purchaser now, able and ready, willing and anxious to buy—the only reason for hesitation—is that he gets the impression in one way or another through the newspapers, and, I fear, frequently from our own subordinates, that there is a possibility in the future of a reduction in prices, and he is, therefore, waiting for that time to come.

WAGES INVOLVED.

It is argued in some of the newspapers that we are making a mistake in maintaining prices because we are keeping large numbers of our employees from work. I do not think the claim is logical or reasonable. I doubt if we would get more business if we should reduce prices. One thing is certain: In view of the high cost of production at the present time and the low prices of our products, which are very much lower than they were in 1907, we cannot, with very slight exceptions, reduce prices unless we reduce the prices which we are paying for labor; and that, I think, would be deplored. I think we should all the time have in mind the best interests of our employees, no matter whether they treat us right or wrong, and regardless of what they may have done in the past. We have the advantage of them in education, in experience, in wealth, in many ways, and we must make it absolutely certain under all circumstances that we treat them right.

You know what has been the attitude of the members of the institute on this subject. Many of you remember the most excellent address of Mr. Dickson before the members of the institute, and you know many circumstances tending to show our friendly attitude toward labor. We must not take a backward step in this matter. We may be forced to reduce wages, anyhow, for maybe they are too high at present, but you, gentlemen, will have to satisfy me with facts and figures before you get my consent to any reduction. I would like to maintain them, if we can, but to do that we must have fair and reasonable prices for our product.

We are all interested. We are traveling together, and we are going to stand together, I believe, without any interruption in the future, and if we do stand together there is nothing that can prevent the greatest success; because it has been and shall be in every respect our intention and our decision to transact our business in such a way as to be sure we are fair and reasonable, and also within the requirements of the law and the demands of the public interest.

NO AGREEMENT ON PRICES.

You may read in the newspapers hints that we are actually making agreements to maintain prices or that we are indirectly or by inference making arrangements which are in restraint of trade, and so we must make it certain that the contrary is true. I would not make an agreement under any circumstances to maintain prices or to do or refrain from doing anything which would prevent me from being absolutely independent from all others in every respect concerning every department of our corporation, or in regard to the conduct of our business, and I would not ask for any different conclusion from others. As I said before, the very fact that it is understood we have this right; that we are independent; that we can go out of this room and do exactly as we please without violating any agreement or understanding, and that all must depend upon the belief that as honorable men we are desirous of conducting ourselves and our business in such a way as not to injure our neighbors, must make each of us much more careful in regard to the conduct of our affairs. And there will be no secrecy in what we do. You may say, "Why aren't the newspaper reporters allowed in this room?" Because, in the first place, many of us, unaccustomed to speak in public, would hesitate to talk in the presence of newspaper men, and because more particularly we might fear we would be incorrectly reported. This is why, I suppose, at these meetings you have delegated me to make a brief statement to the newspapers, so that there will be no opportunity on the part of any one to publish what is not a fact and then make excuse that it was based upon information that he received from some one present at our meeting. There has never been any secrecy on my part. I have never failed to disclose the exact facts in regard to our meetings, and in regard to our conclusions, and that shall be my attitude. I think probably it is better for us to be here together as a family, and without the presence of newspaper representatives, outside of the trade journals.

I want you to criticise me as much as you please—as much as I deserve. If you have fault to find with the conduct of any one connected with our company do not hesitate to speak your mind. If there is anything you want us to do, tell us. If you think we can help you in any way, ask us. If we are injuring you in any respect, do not hesitate to find fault. What is true at this meeting is true at all times. Come to our offices, if you please, and we will work with you so far as we can legitimately. We are proud to work with you.

Those Present at the Dinner

Edward Bailey, president, Central Iron & Steel Company, Harrisburg, Pa.; A. F. Banks, president, Elgin, Joliet & Eastern Railway Company, Chicago; George Bartol, general manager, Otis Steel Company, Cleveland; J. G. Battelle, president, Columbus Iron & Steel Company, Columbus, Ohio; L. E. Block, vice-president, Inland Steel Company, Chicago; W. L. Brown, Pickands, Brown & Co., Chicago; E. J. Buffington, president, Illinois Steel Company, Chicago; J. G. Butler, Jr., president, Bessemer Pig Iron Association, Youngstown, Ohio; A. C. Bolling, assistant general solicitor, United States Steel Corporation, New York.

J. A. Campbell, president, Youngstown Sheet & Tube Company, Youngstown, Ohio; H. S. Chamberlain, president, Roane Iron Company, Chattanooga, Tenn.; Daniel Coolidge, president, Lorain Steel Company, Johnstown, Pa.; H. Coulby, president, Pittsburgh Steamship Company, Cleveland; G. G. Crawford, president, Tennessee Coal, Iron & Railroad Company, Birmingham, Ala.; E. A. S. Clarke, president, Lackawanna Steel Company, New York; D. M. Clemson, president, Carnegie Natural Gas Company, Pittsburgh; T. I. Crane, president, Northern Iron Company, Philadelphia.

W. B. Dickson, first vice-president, United States Steel Corporation, New York; A. C. Dinkey, president, Carnegie Steel Company, Pittsburgh; H. Du Puy, chairman, Crucible Steel Company of America, Pittsburgh.

B. F. Fackenthal, Jr., president, Thomas Iron Company, Easton, Pa.; J. A. Farrell, president, United States Steel Products Company, New York; E. C. Felton, president, Pennsylvania Steel Company, Philadelphia; W. J. Filbert, comptroller, United States Steel Corporation, New York; A. I. Findley, editor, *The Iron Age*, New York.

Elbert H. Gary, chairman, United States Steel Corporation, New York; T. W. Guthrie, president, Republic Iron & Steel Company, Pittsburgh; E. G. Grace, general manager, Bethlehem Steel Company, South Bethlehem, Pa.

H. L. Haldeman, vice-president, Pulaski Iron Company, Philadelphia; Edward H. Hagar, president, Universal Portland

Cement Company, Chicago; J. A. Hatfield, president, American Bridge Company of New York, New York; F. E. House, president, Duluth & Iron Range Railroad Company, Duluth, Minn.; C. R. Hubbard, president, Wheeling Steel & Iron Company, Wheeling, W. Va.; A. F. Huston, president, Lukens Iron & Steel Company, Coatesville, Pa.; O. N. Hutchinson, general manager, Grand Crossing Tack Company, Grand Crossing, Ill.; J. H. Hoyt, Hoyt, Dustin & Kelly, Cleveland; August Heckscher, vice-president, Eastern Steel Company, New York.

J. R. Jones, secretary, Alan Wood Iron & Steel Company, Philadelphia.

W. V. Kelley, president, American Steel Foundries, Chicago; I. A. Kelly, president, Ashland Steel Company, Ashland, Ky.; D. G. Kerr, second vice-president, United States Steel Corporation, New York; Willis L. King, vice-president, Jones & Laughlin Steel Company, Pittsburgh.

Hon. J. G. A. Leishman; C. C. Linthicum, Linthicum Belt & Fuller, Chicago; James Lord, president, American Iron & Steel Mfg. Company, Lebanon, Pa.; Thomas Lynch, president, H. C. Frick Coke Company, Pittsburgh.

Charles MacVeagh, general solicitor, United States Steel Corporation, New York; W. A. McGonagle, president, Duluth, Missabe & Northern Railway Company, Duluth, Minn.; G. G. McMurtry, chairman, American Sheet & Tin Plate Company, New York; Samuel Mather, Pickands, Mather & Co., Cleveland; W. G. Mather, president, Cleveland-Cliffs Iron Company, Cleveland; Harrison S. Morris, president, Wharton Steel Company, Philadelphia.

Benjamin Nicoll, B. Nicoll & Co., New York.

W. J. Olcott, president, Oliver Iron Mining Company, Duluth, Minn.

W. P. Palmer, president, American Steel & Wire Company, Cleveland; E. W. Pargny, president, American Sheet & Tin Plate Company, Pittsburgh; George W. Perkins; Veryl Preston, president, Eastern Steel Company, New York; Charles S. Price, president, Cambria Steel Company, Johnstown, Pa.; Leonard Peckitt, president, Empire Steel & Iron Company, Catasauqua, Pa.; H. F. Perkins, International Harvester Company, Chicago.

J. V. W. Reynders, vice-president, Pennsylvania Steel Company, Steelton, Pa.; Charles A. Rathbone, Buhl Malleable Company, Detroit, Mich.; J. H. Reed, Pittsburgh; David Reeves, president, Phoenix Iron Company, Philadelphia; F. B. Richards, M. A. Hanna & Co., Cleveland; W. A. Rogers, president, Rogers, Brown Iron Company, Buffalo; Wallace H. Rowe, president, Pittsburgh Steel Company, Pittsburgh; James R. Roe, general superintendent, Glasgow Iron Company, Pottstown, Pa.; John Reis, assistant to president, United States Steel Corporation, New York.

J H. Sheadle, secretary, Cleveland-Cliffs Iron Company, Cleveland; W. B. Schiller, president, National Tube Company, Pittsburgh; I. M. Scott, president, La Belle Iron Works, Steubenville, Ohio; F. C. Smink, president, Reading Iron Company, Reading, Pa.; W. P. Snyder, president Shenango Furnace Company, Pittsburgh; Powell Stackhouse, Cambria Steel Company, Philadelphia; C. J. Stark, *Iron Trade Review*, New York; H. H. Stambaugh, treasurer, Brier Hill Iron & Coal Company, Youngstown, Ohio.

Alexis W. Thompson, president, Inland Steel Company, Chicago; John A. Topping, chairman, Republic Iron & Steel Company, New York; Richard Trimble, treasurer, United States Steel Corporation, New York.

George M. Verity, president, American Rolling Mill Company, Middletown, Ohio.

W. R. Walker, assistant to president, United States Steel Corporation, New York; F. S. Witherbee, president, Witherbee, Sherman & Co., New York; F. W. Wood, president, Maryland Steel Company, Sparrows Point, Md.; W. P. Worth, treasurer, Worth Brothers Company, Coatesville, Pa.

August Ziesing, president, American Bridge Company, Chicago.

The Dallas Coal, Iron & Steel Company

An important addition to the industries of Texas is assured by the recent incorporation of the Dallas Coal, Iron & Steel Company of Dallas, with an authorized capital of $2,500,000. The directory is composed mainly of men who are identified with the leading interests of the city. The new company will take over the property of the Jefferson Iron Company, Jefferson, Texas, which began operations in 1891. Though the furnace was blown in on charcoal, the fuel was changed to coke later on. Brown hematite ore from Marion and Cass counties was used, and the annual output averaged about 36,000 tons of foundry iron. About two years since, the furnace was purchased by interests identified with the De Camp Bros. & Yule Iron, Coal & Coke Company, St. Louis. In May, 1909, the Jefferson Company purchased the iron ore property of the Lone Star Iron Company of Texas.

The new company intends to remodel the blast furnace, but it is not yet decided where the mills will be located. These comprise a billet mill and a merchant mill for rolling cotton ties and merchant bars. W. F. McClurg, who formerly operated the Jefferson furnace, will have charge of the work. The company owns about 7000 acres of Texas iron ore lands, and controls enough coking coal to produce its requirements in metallurgical coke. The officers of the company are as follows: President, R. D. Yoakum; vice-president, J. W. Wright; secretary, R. P. Wafford; treasurer, F. J. Shoelkopf. Executive Committee—J. W. Wright, chairman; J. B. Wilson, A. L. Clark, R. D. Yoakum and L. Lipsitz. The directors are J. W. Wright, L. Lipsitz, R. D. Yoakum, A. L. Clark, F. J. Shoelkopf, W. F. McClurg, R. P. Wafford, A. P. De Camp and T. L. Camp.

Canadian Manufacturers Oppose Reciprocity

TORONTO, January 16, 1911.—In manufacturing circles satisfaction is expressed with the answer given by Sir Wilfrid Laurier to the deputation that waited on him last Friday. The memorial presented to him was a petition and argument against reciprocity with the United States, especially reciprocity affecting Canadian manufacturing industries. The Prime Minister's reply was in effect an assurance that due consideration would be given to the manufacturing interests of Canada. The point of it is in the concluding sentences, which are as follows:

> Last spring we received overtures from the nation which occupies the southern part of this continent, which we did not think it wise for us to refuse. But when we decided to meet our neighbors we were not oblivious to the fact that the Americans have their manufacturing industries developed far in advance of us and that conditions are not entirely parallel and identical in both countries. We approached the question in that light, and Mr. Fielding and Mr. Paterson, who are now in Washington, will not forget, and will have before them in the negotiations, that there is not a parity between the two countries. For myself, I think we could make some trade arrangement between the two countries which would not interfere with the manufacturing community.

Sir Wilfrid also dwelt on the fact that the former efforts of his Government to bring about closer trade relations between Canada and the United States were directed to the particular object of reviving the reciprocity treaty of the period 1854-1866. This is significant, as that treaty comprehended only natural products.

While the manufacturers are quite pleased with his answer to their deputation, the farmers are now saying that his answer to their deputation of December 16 looks emptier and emptier the longer it is thought about. It gives them no reason to suppose that the Government will comply with the part of their petition that calls for the facilitating of the importation of manufactured articles from the United States. Both deputations were unprecedentedly strong, the farmers numerically and the manufacturers in personal weight and in the magnitude of the interests they represented.

To newspaper men and others who are looking on critically, the odds appear to be strongly in favor of the manufacturers. The Government knows the manufacturers are in earnest and that they are thoroughly organized to make a campaign in support of their advocacy of protection. Further, the Government knows that in eastern Canada as a whole—in the Maritime Provinces, Quebec and Ontario—the preponderant public opinion is on the side of protection. There is some reason to believe that the demonstration the farmers made at Ottawa was much less the result of a spontaneous rising against protection than of activity on the part of organizers and resolution framers. Sir Wilfrid Laurier may be of that opinion. At all events, neither his answer to the farmers' deputation nor his answer to the manufacturers' deputation gives ground for any expectation that he is prepared to join in a reciprocity arrangement that would put Canadian manufacturers on a tariff footing much more disadvantageous than the one on which they now stand.

C. A. C. J.

The British Board of Trade returns show that 1910 was a record year for British trade, the figures exceeding even those of 1907, which was a boom year. The imports in 1910 were £678,440,173, an increase of £53,735,216 over 1909. The exports amounted to £534,365,915, an increase of £64,840,749.

Fluctuations in Metal Prices for the Period 1898-1910 in Carloads

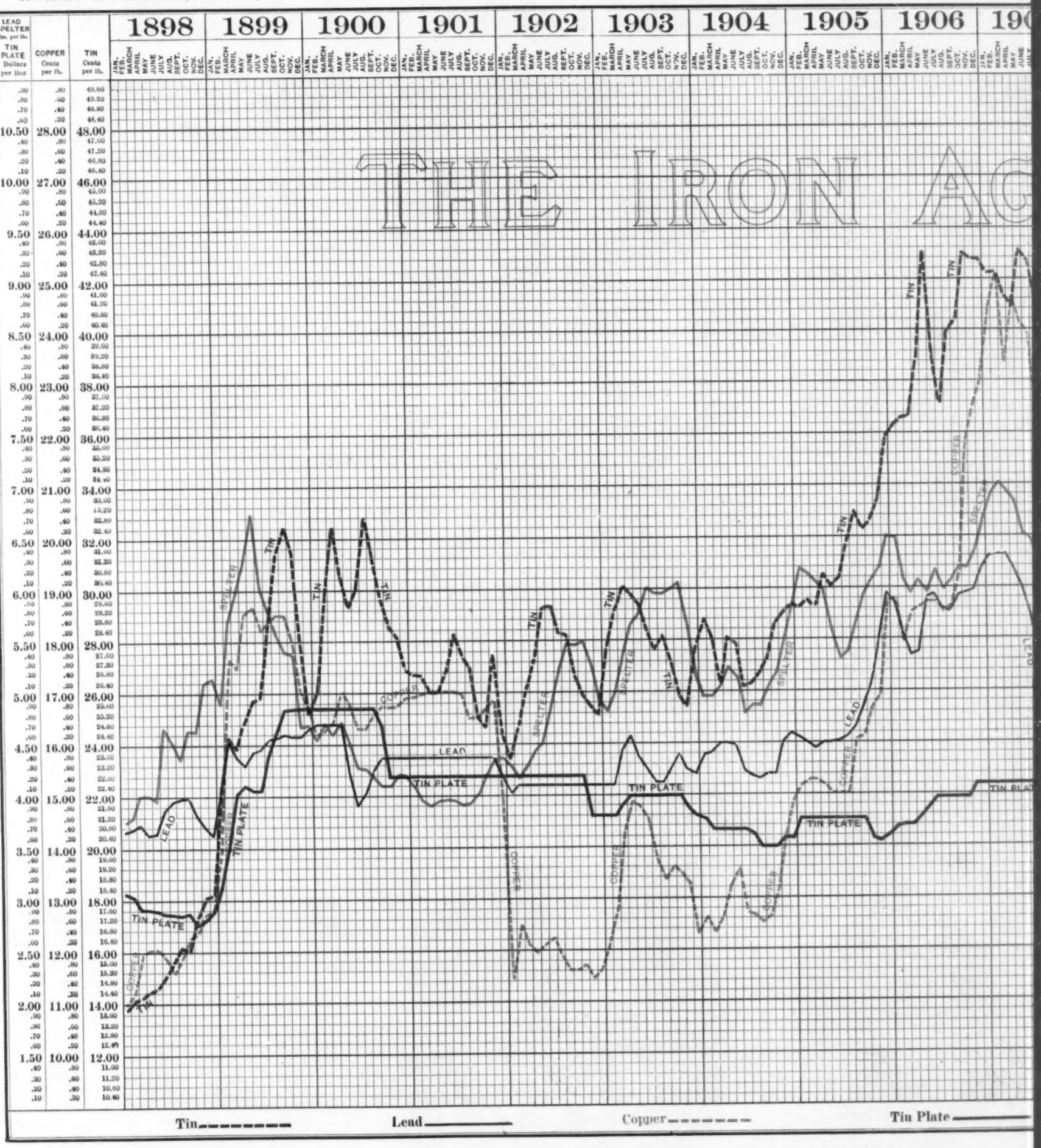
(With Supplement.)

The accompanying supplement shows by plotted lines the fluctuations in prices of the more important metals in the period from 1898 to 1910, inclusive. The prices used for this purpose are the computed monthly averages of the prices of carloads, at New York, given in the metal market reports of *The Iron Age* week by week. The columns of figures alongside the chart give the values. The column to the left gives tin in cents per pound, the middle column, copper in cents per pound, and the first represents lead and spelter in cents per pound and tin plate in dollars per base box. The following tables give the monthly averages, on which the chart is based:

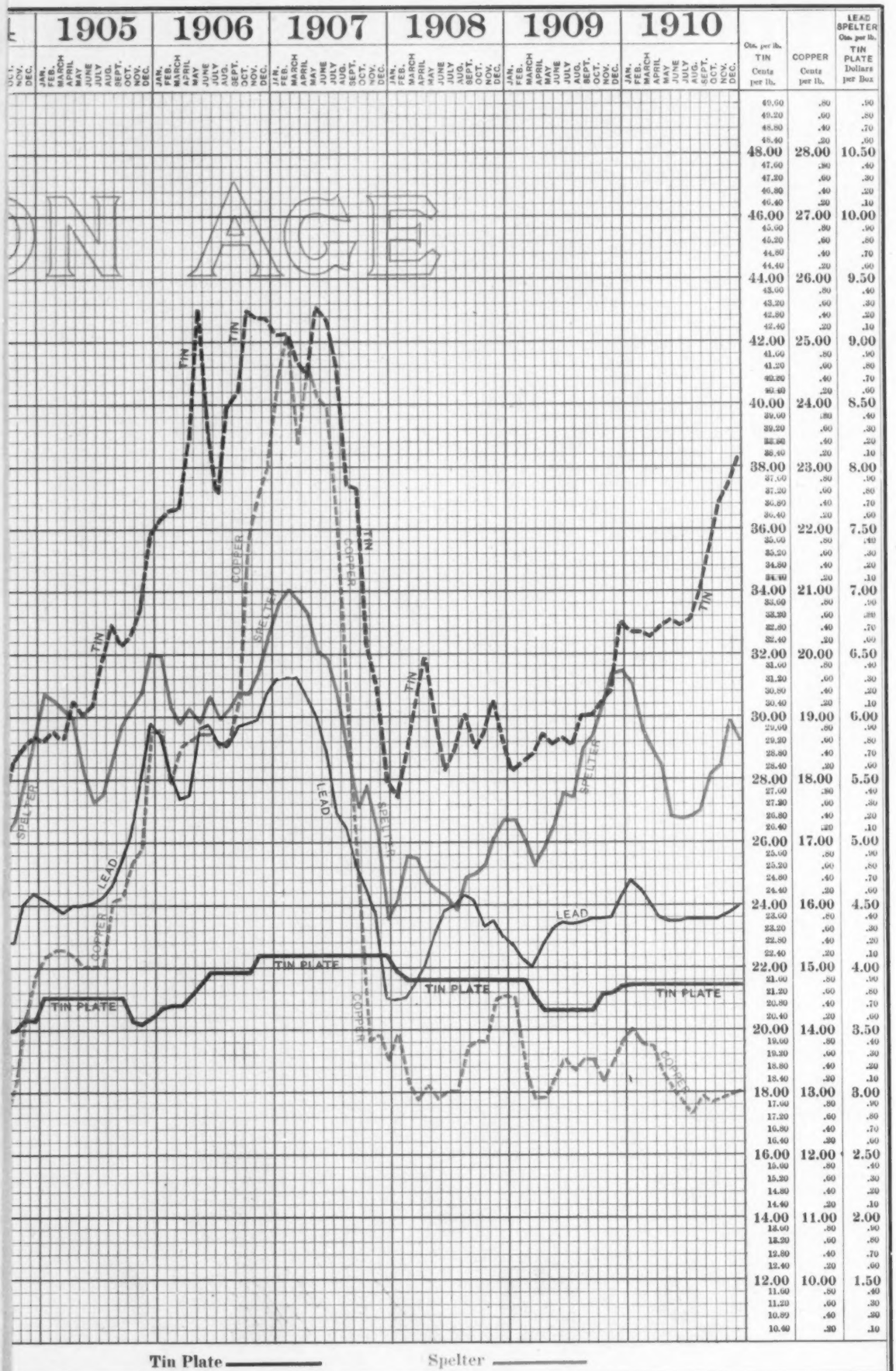
Average Monthly Prices, 1898-1910.

1898 Months.	Lake copper. Cents.	Spelter. Cents.	Lead. Cents.	Tin. Cents.	Tin plate. Dollars.
January	11.00	3.75	3.66	13.77	3.05
February	11.19	3.79	3.69	14.04	3.02
March	11.95	4.00	3.71	14.26	2.90
April	12.05	4.00	3.61	14.41	2.90
May	12.04	3.95	3.64	14.54	2.89
June	11.85	4.65	3.86	15.05	2.85
July	11.59	4.51	3.95	15.60	2.84
August	11.85	4.35	3.99	16.14	2.82
September	12.25	4.62	3.99	16.02	2.85
October	12.37	4.61	3.81	17.25	2.75
November	12.69	5.09	3.70	18.07	2.80
December	12.79	5.13	3.62	18.20	2.89
1899					
January	14.02	4.90	4.02	22.12	3.11
February	17.66	5.68	4.53	24.25	3.50
March	17.55	5.99	4.37	23.86	4.03
April	18.56	6.25	4.30	24.82	4.10
May	18.65	6.72	4.42	25.61	4.05
June	18.20	6.02	4.45	25.69	4.05
July	18.37	5.79	4.55	28.72	4.38
August	18.50	5.55	4.56	31.40	4.60
September	18.47	5.40	4.60	32.40	4.82
October	18.03	5.37	4.59	31.35	4.82
November	17.00	4.64	4.58	28.52	4.83
December	16.69	4.68	4.65	25.19	4.84
1900					
January	16.21	4.55	4.70	26.00	4.84
February	16.25	4.69	4.70	29.71	4.84
March	16.41	4.60	4.70	32.42	4.84
April	17.00	4.71	4.70	30.85	4.84
May	16.80	4.52	4.22	29.25	4.84
June	16.31	4.27	3.90	30.00	4.84
July	16.31	4.24	4.03	32.76	4.84
August	16.55	4.17	4.26	31.13	4.84
September	16.75	4.10	4.36	29.63	4.68
October	16.73	4.10	4.37	28.46	4.19
November	16.75	4.20	4.37	28.10	4.19
December	16.87	4.19	4.37	26.84	4.19
1901					
January	16.90	4.08	4.37	26.60	4.19
February	16.97	3.94	4.37	26.55	4.19
March	17.00	3.89	4.37	25.95	4.19
April	17.00	3.94	4.37	25.94	4.19
May	17.00	3.97	4.37	26.82	4.19
June	17.00	3.95	4.37	28.22	4.19
July	16.97	3.90	4.37	27.41	4.19
August	16.50	3.92	4.37	26.90	...
September	16.50	4.02	4.37	25.04	4.19
October	16.71	4.20	4.37	24.62	4.19
November	16.82	4.32	4.37	27.47	4.19
December	14.71	4.35	4.19	24.39	4.19
1902					
January	11.45	4.28	4.02	23.38	4.19
February	12.47	4.18	4.10	24.73	4.19
March	12.12	4.29	4.10	26.16	4.19
April	11.97	4.41	4.10	27.29	4.19
May	12.10	4.50	4.10	29.26	4.19
June	12.23	4.88	4.10	29.29	4.19
July	11.94	5.23	4.10	28.28	4.19
August	11.59	5.46	4.10	28.14	4.19
September	11.60	5.45	4.10	26.55	4.19
October	11.71	5.48	4.10	25.76	4.19
November	11.44	5.29	4.10	25.43	3.79
December	11.61	4.91	4.10	25.33	3.79
1903					
January	12.13	4.82	4.10	27.76	3.79
February	12.80	5.00	4.10	29.14	3.79
March	14.31	5.36	4.44	30.06	3.90
April	14.85	5.65	4.59	29.69	3.99
May	14.75	5.75	4.37	29.36	3.99
June	14.56	6.00	4.25	28.30	3.99
July	13.73	5.95	4.12	27.60	3.99
August	13.35	5.94	4.12	28.00	3.99
September	13.58	6.00	4.26	27.06	3.99
October	13.42	6.05	4.40	25.83	3.99
November	13.25	5.68	4.25	25.35	3.84
December	12.30	5.15	4.19	27.53	3.79
1904					
January	12.62	4.95	4.39	28.75	3.75
February	12.34	4.95	4.40	27.98	3.64
March	12.60	5.05	4.50	26.19	3.64
April	13.19	5.22	4.50	27.99	3.64
May	13.28	5.14	4.48	27.76	3.64
June	12.74	4.79	4.22	26.14	3.64
July	12.62	4.85	4.17	26.28	3.60
August	12.50	4.85	4.15	26.74	3.49
September	12.67	5.06	4.20	27.27	3.49
October	13.09	5.17	4.20	28.53	3.49
November	14.22	5.49	4.51	29.00	3.56
December	14.87	5.80	4.60	29.27	3.56
1905					
January	15.18	6.17	4.56	29.18	3.74
February	15.25	6.12	4.50	29.49	3.74
March	15.25	6.06	4.45	29.21	3.74
April	15.18	5.97	4.50	30.43	3.74
May	15.00	5.55	4.50	30.04	3.74
June	15.00	5.32	4.51	30.36	3.74
July	15.03	5.38	4.56	31.71	3.74
August	16.07	5.66	4.64	32.85	3.74
September	16.12	5.83	4.85	32.21	3.74
October	16.62	6.05	5.07	32.47	3.55
November	16.90	6.17	5.48	33.46	3.53
December	18.75	6.50	5.96	35.84	3.59
1906					
January	18.78	6.48	5.86	36.36	3.66
February	17.94	6.09	5.56	36.48	3.69
March	18.50	5.96	5.35	36.62	3.69
April	18.62	6.05	5.39	38.86	3.76
May	18.70	5.95	5.90	43.08	3.85
June	18.69	6.14	5.94	38.97	3.94
July	18.47	5.98	5.80	37.18	3.94
August	18.65	6.06	5.78	39.90	3.94
September	19.31	6.19	5.92	40.32	3.94
October	21.81	6.18	5.94	42.90	3.94
November	22.50	6.36	5.97	42.70	4.09
December	23.06	6.62	6.19	42.62	4.09
1907					
January	24.41	6.90	6.30	42.14	4.09
February	25.10	7.00	6.31	42.16	4.09
March	23.38	6.92	6.31	41.29	4.09
April	24.62	6.81	6.16	40.84	4.09
May	24.10	6.51	6.02	43.01	4.09
June	23.94	6.45	5.75	42.65	4.09
July	21.95	6.15	5.24	41.15	4.09
August	18.94	5.71	5.12	37.35	4.09
September	16.41	5.28	4.84	37.22	4.09
October	13.80	5.45	4.64	32.33	4.09
November	13.94	5.10	4.45	30.81	4.09
December	13.48	4.39	3.76	27.92	4.09
1908					
January	13.90	4.54	3.73	27.43	3.95
February	13.13	4.78	3.75	28.74	3.89
March	12.85	4.76	3.88	30.46	3.89
April	13.09	4.68	4.02	31.79	3.89
May	12.88	4.60	4.26	29.84	3.89
June	13.00	4.56	4.45	28.18	3.89
July	13.00	4.46	4.50	28.92	3.89
August	13.71	4.71	4.59	29.99	3.89
September	13.80	4.76	4.54	28.91	3.89
October	13.81	4.81	4.34	29.44	3.89
November	14.44	5.03	4.39	30.43	3.89
December	14.53	5.17	4.24	29.13	3.89
1909					
January	14.56	5.15	4.19	28.19	3.89
February	13.37	4.99	4.07	28.44	3.89
March	12.90	4.81	4.02	28.75	3.74
April	12.94	4.94	4.19	29.35	3.64
May	13.21	5.12	4.32	29.07	3.64
June	13.50	5.39	4.36	29.26	3.64
July	13.34	5.35	4.35	29.05	3.64
August	13.56	5.74	4.36	29.96	3.64
September	13.50	5.85	4.39	30.00	3.66
October	13.19	6.09	4.39	30.41	3.74
November	13.44	6.32	4.40	30.74	3.79
December	13.80	6.35	4.56	32.91	3.82
1910					
January	14.00	6.26	4.70	32.61	3.84
February	13.78	5.89	4.63	32.65	3.84
March	13.75	5.72	4.51	32.51	3.84
April	13.31	5.60	4.40	32.83	3.84
May	13.06	5.20	4.37	33.05	3.84
June	12.88	5.19	4.38	32.79	3.84
July	12.66	5.20	4.40	32.99	3.84
August	12.93	5.26	4.40	33.92	3.84
September	12.81	5.53	4.40	35.17	3.84
October	12.84	5.69	4.40	36.76	3.84
November	12.98	5.95	4.44	37.38	3.84
December	13.00	5.80	4.50	38.21	3.84

LEAD SPELTER Cts. per lb.	TIN PLATE Dollars per Box	COPPER Cents per lb.	TIN Cents per lb.
		.80	49.60
		.60	49.20
		.40	48.80
		.20	48.40
10.50	28.00		48.00
.40		.80	47.60
.30		.60	47.20
.20		.40	46.80
.10		.20	46.40
10.00	27.00		46.00
.90		.80	45.60
.80		.60	45.20
.70		.40	44.80
.60		.20	44.40
9.50	26.00		44.00
.40		.80	43.60
.30		.60	43.20
.20		.40	42.80
.10		.20	42.40
9.00	25.00		42.00
.90		.80	41.60
.80		.60	41.20
.70		.40	40.80
.60		.20	40.40
8.50	24.00		40.00
.40		.80	39.60
.30		.60	39.20
.20		.40	38.80
.10		.20	38.40
8.00	23.00		38.00
.90		.80	37.60
.80		.60	37.20
.70		.40	36.80
.60		.20	36.40
7.50	22.00		36.00
.40		.80	35.60
.30		.60	35.20
.20		.40	34.80
.10		.20	34.40
7.00	21.00		34.00
.90		.80	33.60
.80		.60	33.20
.70		.40	32.80
.60		.20	32.40
6.50	20.00		32.00
.40		.80	31.60
.30		.60	31.20
.20		.40	30.80
.10		.20	30.40
6.00	19.00		30.00
.90		.80	29.60
.80		.60	29.20
.70		.40	28.80
.60		.20	28.40
5.50	18.00		28.00
.40		.80	27.60
.30		.60	27.20
.20		.40	26.80
.10		.20	26.40
5.00	17.00		26.00
.90		.80	25.60
.80		.60	25.20
.70		.40	24.80
.60		.20	24.40
4.50	16.00		24.00
.40		.80	23.60
.30		.60	23.20
.20		.40	22.80
.10		.20	22.40
4.00	15.00		22.00
.90		.80	21.60
.80		.60	21.20
.70		.40	20.80
.60		.20	20.40
3.50	14.00		20.00
.40		.80	19.60
.30		.60	19.20
.20		.40	18.80
.10		.20	18.40
3.00	13.00		18.00
.90		.80	17.60
.80		.60	17.20
.70		.40	16.80
.60		.20	16.40
2.50	12.00		16.00
.40		.80	15.60
.30		.60	15.20
.20		.40	14.80
.10		.20	14.40
2.00	11.00		14.00
.90		.80	13.60
.80		.60	13.20
.70		.40	12.80
.60		.20	12.40
1.50	10.00		12.00
.40		.80	11.60
.30		.60	11.20
.20		.40	10.80
.10		.20	10.40



Fluctuations in the Prices of Copper, Lead, Tin, Spe
New York from January 1, 1898, to December 31,



Cts. per lb. TIN Cents per lb.	COPPER Cents per lb.	LEAD SPELTER Cts. per lb. TIN PLATE Dollars per Box
49.60	.80	.90
49.20	.60	.80
48.80	.40	.70
48.40	.20	.60
48.00	**28.00**	**10.50**
47.60	.80	.40
47.20	.60	.30
46.80	.40	.20
46.40	.20	.10
46.00	**27.00**	**10.00**
45.60	.80	.90
45.20	.60	.80
44.80	.40	.70
44.40	.20	.60
44.00	**26.00**	**9.50**
43.60	.80	.40
43.20	.60	.30
42.80	.40	.20
42.40	.20	.10
42.00	**25.00**	**9.00**
41.60	.80	.90
41.20	.60	.80
40.80	.40	.70
40.40	.20	.60
40.00	**24.00**	**8.50**
39.60	.80	.40
39.20	.60	.30
38.80	.40	.20
38.40	.20	.10
38.00	**23.00**	**8.00**
37.60	.80	.90
37.20	.60	.80
36.80	.40	.70
36.40	.20	.60
36.00	**22.00**	**7.50**
35.60	.80	.40
35.20	.60	.30
34.80	.40	.20
34.40	.20	.10
34.00	**21.00**	**7.00**
33.60	.80	.90
33.20	.60	.80
32.80	.40	.70
32.40	.20	.60
32.00	**20.00**	**6.50**
31.60	.80	.40
31.20	.60	.30
30.80	.40	.20
30.40	.20	.10
30.00	**19.00**	**6.00**
29.60	.80	.90
29.20	.60	.80
28.80	.40	.70
28.40	.20	.60
28.00	**18.00**	**5.50**
27.60	.80	.40
27.20	.60	.30
26.80	.40	.20
26.40	.20	.10
26.00	**17.00**	**5.00**
25.60	.80	.90
25.20	.60	.80
24.80	.40	.70
24.40	.20	.60
24.00	**16.00**	**4.50**
23.60	.80	.40
23.20	.60	.30
22.80	.40	.20
22.40	.20	.10
22.00	**15.00**	**4.00**
21.60	.80	.90
21.20	.60	.80
20.80	.40	.70
20.40	.20	.60
20.00	**14.00**	**3.50**
19.60	.80	.40
19.20	.60	.30
18.80	.40	.20
18.40	.20	.10
18.00	**13.00**	**3.00**
17.60	.80	.90
17.20	.60	.80
16.80	.40	.70
16.40	.20	.60
16.00	**12.00**	**2.50**
15.60	.80	.40
15.20	.60	.30
14.80	.40	.20
14.40	.20	.10
14.00	**11.00**	**2.00**
13.60	.80	.90
13.20	.60	.80
12.80	.40	.70
12.40	.20	.60
12.00	**10.00**	**1.50**
11.60	.80	.40
11.20	.60	.30
10.80	.40	.20
10.40	.20	.10

Lead, Tin, Spelter and Tin Plate in December 31, 1910 in Carloads.

The Bristol Class III. Recording Thermometer

A Gas Filled Instrument with an Automatic Compensating Device

Recording thermometers depending for their operation upon the expansion of a liquid, the vapor of a liquid or a gas have been made in numerous different forms during the last 15 years by the Bristol Company, Waterbury, Conn. Although instruments of this character have been used very extensively for measuring temperatures ranging up to 800 degrees F., it is only lately that a thermometer depending for its operation upon the expansion of a vapor or a gas and transmitting this volumetric change through the connecting tube between the sensitive bulb and the instrument has been adapted for recording lower

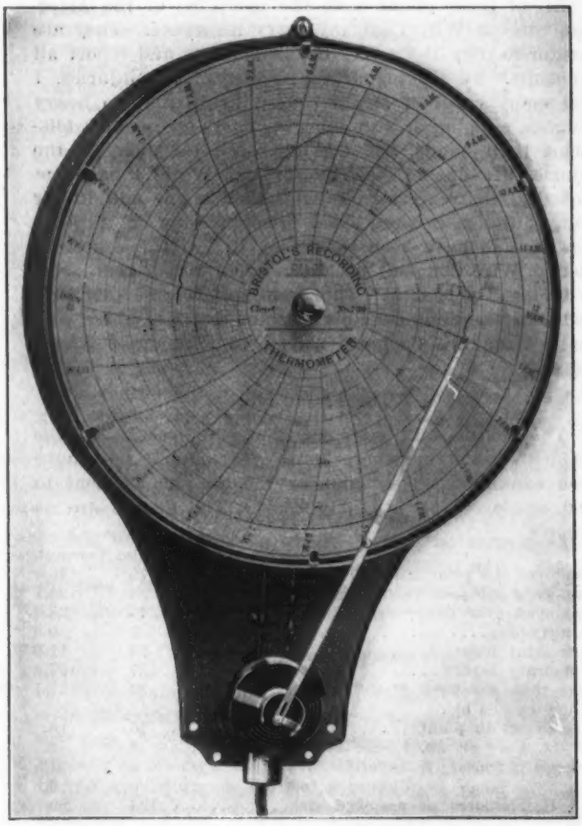


Fig. 1.—The Interior of the New Class III. Compensated Recording Thermometer Manufactured by the Bristol Company, Waterbury, Conn.

ranges of temperature. Fig. 1 shows the interior of a new compensated gas filled recording thermometer known as the class III., while Figs. 2 and 3 show specimen records, one of condenser circulating water temperatures and the other of boiler feed water temperatures. This type of instrument has been developed for recording the lower ranges of temperatures, such as that of the atmosphere, water, brine and refrigerating systems, &c., and is equipped with a compensating device which automatically makes corrections for temperature changes at the recording instrument. This compensating device is a very important feature of this new thermometer, as an instrument so equipped will give an accurate record of the temperature being measured regardless of any changes in temperature at the recording instrument itself. The necessity for such a compensating attachment can be best illustrated by the application of a recording thermometer to measuring temperature of brine in a refrigerating system. Although the temperature of the brine at the point where the sensitive bulb was installed might remain constant, that of the atmosphere at the point where the recording instrument was placed might

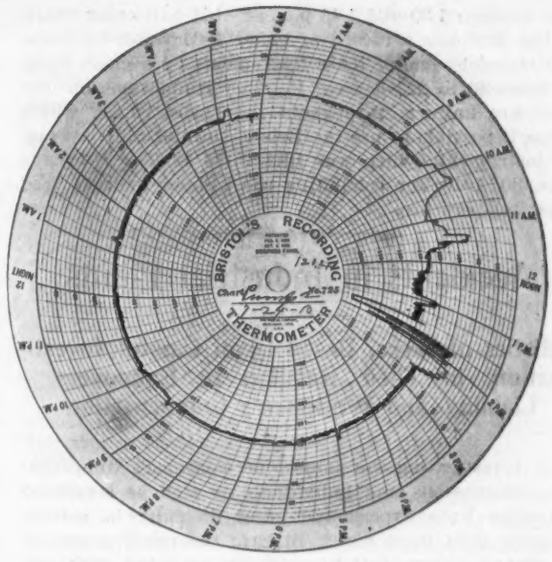


Fig. 2.—A Record of Condenser Circulating Water Temperatures Obtained with One of These New Instruments.

change, and a recording thermometer for this class of work should, of course, be constructed so that only temperature changes at the sensitive bulb would affect its records.

The class III. thermometers are equipped with a special spiral pressure tube, shown in the lower part of Fig. 1, a capillary connecting tube which is cut off at the bottom of the engraving and a sensitive bulb which is not shown, the bulb and the connecting tube being filled with an inert gas under pressure. Temperature changes at the sensitive bulb produce corresponding changes in the pressure of the confined gas according to the laws governing the volumes of gases, and these changes are measured and recorded by the instrument. To make the error due to changes in temperature along the connecting tube negligible the volume of gas contained in the sensitive bulb, which is generally 10 in. long and ¾ in. in diameter, is very large in proportion to that in the capillary connecting tube.

A record of condenser circulating water temperatures as traced by one of these thermometers on a chart having a range of from 40 to 220 degrees F. is reproduced in Fig. 2. It will be noticed from an examination of this chart that the scale of uniform graduations is reversed, which for measuring the temperature of condenser circulating water is a desirable feature. While the average temperatures are generally below 145 degrees at the same time when the condenser loses its vacuum, the temperature may reach the boiling point, as was the

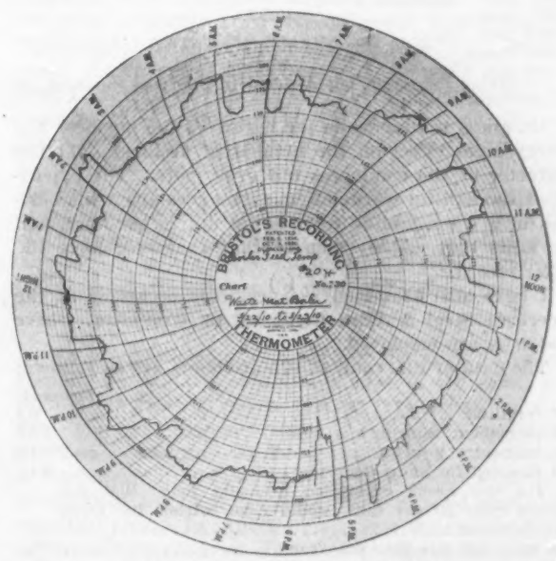


Fig. 3.—A Specimen Chart of Boiler Feed Water Temperature.

case between 1.30 and 1.45 p.m. on this particular chart.

Fig. 3 shows a record of boiler feed water temperature traced by one of these instruments on a chart ranging from 40 to 225 degrees F. The graduations on this chart are uniform throughout the entire range, which makes it possible to use the Bristol-Durand radii averaging instrument, which was illustrated in *The Iron Age* June, 30, 1910, for computing the 24-hour average feed water temperature.

Accidents in Industrial Plants

Statistics of Risks, Based Upon Careful Investigation, in Their Relation to Employers' Liability and Workmen's Compensation

In investigating the subject of workmen's compensation, commissions and individuals as well as insurance companies have experienced great difficulty in getting adequate data upon which to base the relative cost to the manufacturer of the system as compared with employers' liability. Frank F. Dresser, Worcester, Mass., has given this important matter very careful attention, and some of the results of his investigations formed part of an address made by him before the Boston Branch, National Metal Trades Association, at Boston, January 4. His statement is as follows:

Total Data of Accidents in Five Mills

I have examined 674 accidents occurring in five mills. for the most part my information about them comes from the accident reports, though in a large proportion of them I have seen the results of an independent investigation. These accidents were as follows:

	Number of accidents.	Total number of employees.
All that occurred in 1½ years in a textile mill.	156	2,040
All that occurred in 2 years and 10 months in a foundry	13	125
All that occurred in 2 years and 10 months in a machine shop	8	150
All that occurred in 2 years in a leather supplies factory	135	1,500
All that occurred in 1 year in a carpenter and machine shop	79	3,035
Totals	391	6,850

Reduced to a yearly basis, there were 257 accidents out of 6,850 men employed.

The proportion of accidents to employees in the different departments of these factories is as follows:

One accident to	Per cent.
19½ men	5.1
27 men	3.6
53 men	1.8
22 men	4.5
87 men	1.1
19.6 men	5.1
43.8 men	2.28

Or, taking the totals, one accident to 26.6 men employed, or 3.7 per cent.

My guess is that while the nature of the business has a very great effect on the number of accidents, yet the character of the employees has even more. The experienced and skillful workman, one who goes about his business in a workmanlike way, is not apt to get hurt, and the mills that employ men of that character have the better record.

I have also examined 284 accidents occurring at the American Steel & Wire Company in Worcester, where 5854 men are employed.

The data of this total of 675 accidents are as follows:

	Per cent.
2 fatalities	0.3
84 permanent injuries, not quite	12.5
588 temporary injuries	87.2
234 disabled for more than one week	34.
On the two weeks' exemption I should judge that not more than 20 per cent. would come within the scope of payment	20.
Men employed less than one year	52.
Men employed one to five years	23.
Men employed five years or more	25.

	Per cent.
82 accidents due to defective plant	12.
2 accidents due to negligence of a superintendent	0.3
6 accidents due to failure to instruct	0.9
46 accidents due to negligence of fellow servants	6.8
538 accidents were due to contributory negligence or an incidental risk of the business	80.

Under the law as it stands at present I doubt if there would be liability in more than 11 per cent. of these cases. The surprisingly few cases of negligence of a superintendent shows that a repeal of the employers' liability act would have very slight effect on these industries, though it would, of course, have a greater effect upon the railroads. It is likely that an investigation going beyond the accident report might show more instances of negligent superintendents.

In four plants, covering 595 accidents, 49 claims, or 8 per cent., were made; lawyers represented plaintiff in 11 claims, and but four writs were brought. These data as to claims are from my files, and I think undoubtedly that more claims were made and paid.

All of these plants with the exception of the American Steel & Wire Company carry insurance. They are careful to obey the safety device statutes and report all accidents. In looking at the nature of the injuries, I find many cases of strain caused by lifting too heavy weights, slipping or stumbling on floors, green men blistering their hands, and the like. A great many of the injuries are due to blood poisoning. While I have not looked at that carefully, I judge that in one mill 10 per cent. of the cases were blood poisoning, and one fatality was said to have been caused by it. In the American Steel & Wire Company accidents about 20 per cent. seem to be blood poisoning. This is in spite of the fact that each of these mills employs a doctor and mill nurse, and that efforts are made to attend to such cases immediately.

The Textile Mill

The textile mill employs 2040 employees. All the accidents occurring there for a year and a half have been examined. They number 156, or one accident to 19.6 employees on a yearly basis. The details are as follows:

	Accidents.	Per cent.
Employed one year or less	75	48.1
Employed one year to five years	36	23.1
Employed over five years	45	28.8
Fatality	1	0.6
Permanent injury	18	11.6
Temporary injury	137	87.8
More than one week disability	59	37.7
Injury caused by:		
1. Defect in plant	25	16.
2. Carelessness { a. Fellow servant	5	2.5
2. Carelessness { b. Superintendent or delegate.	2	1.5
2. Carelessness { c. Failure to instruct	0	0.
3. Carelessness or assumed risk	124	80.
Number of claims made		4
Number of claims paid		4
Intervention of plaintiff's lawyer		4
Writs brought		1

This mill employs a mill nurse, whose business it is to give temporary aid alone or in conjunction with the doctor, and to attend to the care of the patients when they are not in a city hospital. The necessary medical attention is paid for by the mill. An injured person is kept on the payroll at full wages for two weeks. After that time he is kept on the payroll, when authority is obtained from the treasurer, for a reasonable time. This reasonable time is generally until he is able to come back to work or until he makes claim for other compensation. The four claims paid approximately only the lost wages; the highest amount paid was $350.

Of the 16 per cent. of defect in plant causes a large number of the accidents could probably be avoided by the installation of a more perfect system in one particular; but, although they might be avoided in that way, in only a small proportion would there be liability because the plaintiff would have assumed the risk of the obvious danger upon entry into the employment where such conditions existed. There would seem to be probable liability in about 11 per cent. of all accidents.

Under a compensation act where no payment was made for disability of a week or under, 97 employees, or

62 per cent. of all injured, would receive no compensation whatever. A compensation plan whereby all suits were avoided would cost this particular mill very little, if any, more than it at present pays for its liability insurance and the full time wages to all disabled employees. It would not tend to improve the relations between employer and employed, which have always been good.

The American Steel & Wire Company

Two hundred and eighty-four accidents at the four Worcester plants of the American Steel & Wire Company have been examined. These employed at the time of these accidents 5854 employees. These 284 accidents are those denominated "serious" accidents, meaning a week's disability or a permanent injury. Slighter accidents are not reported in such detail, though the number is known. The details are as follows:

	Accidents.	Per cent.
Employed one year or less	152	53.8
Employed one year to five years	57	20.
Employed over five years	75	26.2
Fatality	1	0.4
Permanent injuries	24	8.4
Temporary injuries	259	91.2
Disabled less than one week	194	68.3
Disabled one week to one month	66	23.3
Disabled more than one month	24	8.4
Injuries caused by:		
1. Defect in plant	25	8.8
2. Carelessness { a. Fellow servants	18	6.4
2. Carelessness { b. Superintendent or delegate.	0	0.
2. Carelessness { c. Failure to instruct	6	6.2
3. Carelessness or assumed risk	235	82.7
Number of claims paid	34	12.
(or 37 per cent. of disability for more than one week.)		
Intervention of plaintiff's lawyer		4
Writs brought		0

That of these accidents only 8.8 per cent. could be fairly ascribed to defect in plant and that there were none chargeable to a careless superintendent or delegate speaks remarkably well. I had supposed that the percentage would be much greater. There would be about 13 per cent. cases of liability under the law as it stands at present.

Under a compensation act 194 of these so-called injuries, or 68 per cent., would receive no compensation, and this number receive no compensation now. Of the injuries not reported in detail the percentage would be very much higher.

The Foundry and Machine Shop

From January 1, 1908, to November 1, 1910, there were 21 accidents in all, one report missing. The foundry had 13 accidents for 125 employees, or, on a yearly basis, 1 to 35 men employed. The shop had 8 accidents to 150 employees, or, on a yearly basis, 1 to 81 men employed. Very few green men are employed, practically none in the machine shop, and they are of a high grade. The details are as follows:

	Accidents.	Per cent.
Employed less than one year	8	40.
Employed one year to five years	7	35.
Employed over five years	5	25.
Fatalities	0	0.
Permanent injury	5	25.
Temporary injury	15	75.
Disability less than one week	3	15.
Injury caused by:		
1. Defect in plant	2	10.
2. Careless servants { a. Fellow servants	7	35.
2. Careless servants { b. Superintendent or delegate.	0	0.
2. Careless servants { c. Failure to instruct	0	0.
3. Carelessness of plaintiff or assumed risk	11	55.
Settlements	7	35.
Intervention of plaintiff's lawyer		1
Writs brought		1
Amounts paid in settlement, not including medical expenses		$522.50

In the third class the very great majority of these cases were due to the carelessness of the plaintiff rather than to incidental risks of the business.

In 15 per cent. of these cases there would be no compensation paid under a compensation act. There is about 10 per cent. liability under the law as it now stands. A compensation act on the English model would largely increase the cost to this company.

The Leather Working Factory

All the accidents in the years 1908 and 1909 are covered in the data here presented. There are 1500 men employed and there were 135 accidents, or, on a yearly basis, one accident to 22 men. The details are as follows:

	Accidents.	Per cent.
Employed one year or less	54	40.
Employed one year to five years	42	31.2
Employed five years or more	39	28.8
Fatalities	0	0.
Permanent injuries	23	17.
Temporary injuries	112	83.
Disability one week or less	95	70.3
Injuries caused by:		
1. Defect in plant	14	10.4
2. Careless servants { a. Fellow servants	12	8.9
2. Careless servants { b. Superintendent or delegate.	0	0.
2. Careless servants { c. Failure to instruct	0	0.
3. Carelessness of plaintiff or assumed risk	109	80.7
Claims made		4
Intervention of plaintiff's lawyer		2
Writs brought		2

These cases show about 7 per cent. liability with the law as it stands now. Of the third class of cases 64.4 per cent. were due to the contributory negligence of the plaintiff and 16.3 per cent. to the incidental and inevitable risks of the business. During five years there have been but three writs brought, all of which have been settled without trial.

Under the compensation act 70 per cent. of the injured would receive nothing. The cost to this mill of a compensation act would be greater than it at present pays.

Carpenter, Foundry and Machine Shop

The accidents occurred during the year 1909. The employees numbered 3035; number of accidents, 79; or, on a yearly basis, one accident in 38.4. The details are as follows:

	Accidents.	Per cent.
Employed one year or less	54	68.4
Employed one year to five years	16	20.2
Employed over five years	9	11.4
Fatalities	0	0.
Permanent injuries	14	17.8
Temporary injuries	65	82.2
Disabled over one week	27	34.
Injury caused by:		
1. Defect in plant	16	20.1
2. Careless servants { a. Fellow servants	4	5.
2. Careless servants { b. Superintendent or delegate.	0	0.
2. Careless servants { c. Failure to instruct	0	0.
3. { a. Incidental risk	41	52.
3. { b. Contributory negligence	18	23.

Stephens-Adamson Offices.—The Stephens-Adamson Mfg. Company, Aurora, Ill., has recently strengthened its organization by securing the services of G. H. Stephens, who has been a prominent factor in the conveying industry for over 20 years, and has obtained a substantial interest in the company, and will assume at once the management of its entire Eastern business. The Eastern office is located at 50 Church street, New York City. The engineering department of the New York office is under the charge of J. G. Marcrum, formerly associated with Mr. Stephens in business. Earl D. Stearns, who has represented the company in the East for the past two years, will henceforth take charge of the Chicago office in the First National Bank Building. The Stephens-Adamson Mfg. Company manufactures a complete line of conveying, elevating, screening and power transmitting machinery. The main office and shops are located at Aurora, Ill., on the main line of the Burlington Railroad. These shops are thoroughly modern in every respect.

Recent developments in modern industrial construction are particularly apparent in some of the newer railroad shops finished and in process throughout the country. The handsome new shops of the New York Central at West Albany and the large new shops of the Chicago & Northwestern at Chicago allow an immense expanse of windows of the Fenestra type, made in solid metal bars of rolled steel. In practice this more substantial filling of window openings is shown to be successful and economical.

Machine and Boiler Shops of Improved Construction

Features of Recent Additions to the Plant of the York Mfg. Company

The York Mfg. Company, York, Pa., has been making improvements from time to time to meet the demand not only for increased capacity for the production of refrigerating machinery, but also for greater efficiency and economy in manufacture. Modern equipment has been installed and advanced methods adopted in many departments. The purpose of this article is to describe and illustrate two of the most recent additions this company has made, which have largely increased its productive capacity—its new machine and boiler shops. These embody the most recent ideas as to construction, heating, lighting and ventilation, together with an arrangement of tools and machinery and methods for handling material which are best adapted for its class of work. The details of construction, as well as those of arrangement, are the work of the company's own engineers. The construction of the buildings is along the lines of almost perfect proof against fire; abundant daylight and ventilation are provided, and the welfare of the employees duly regarded.

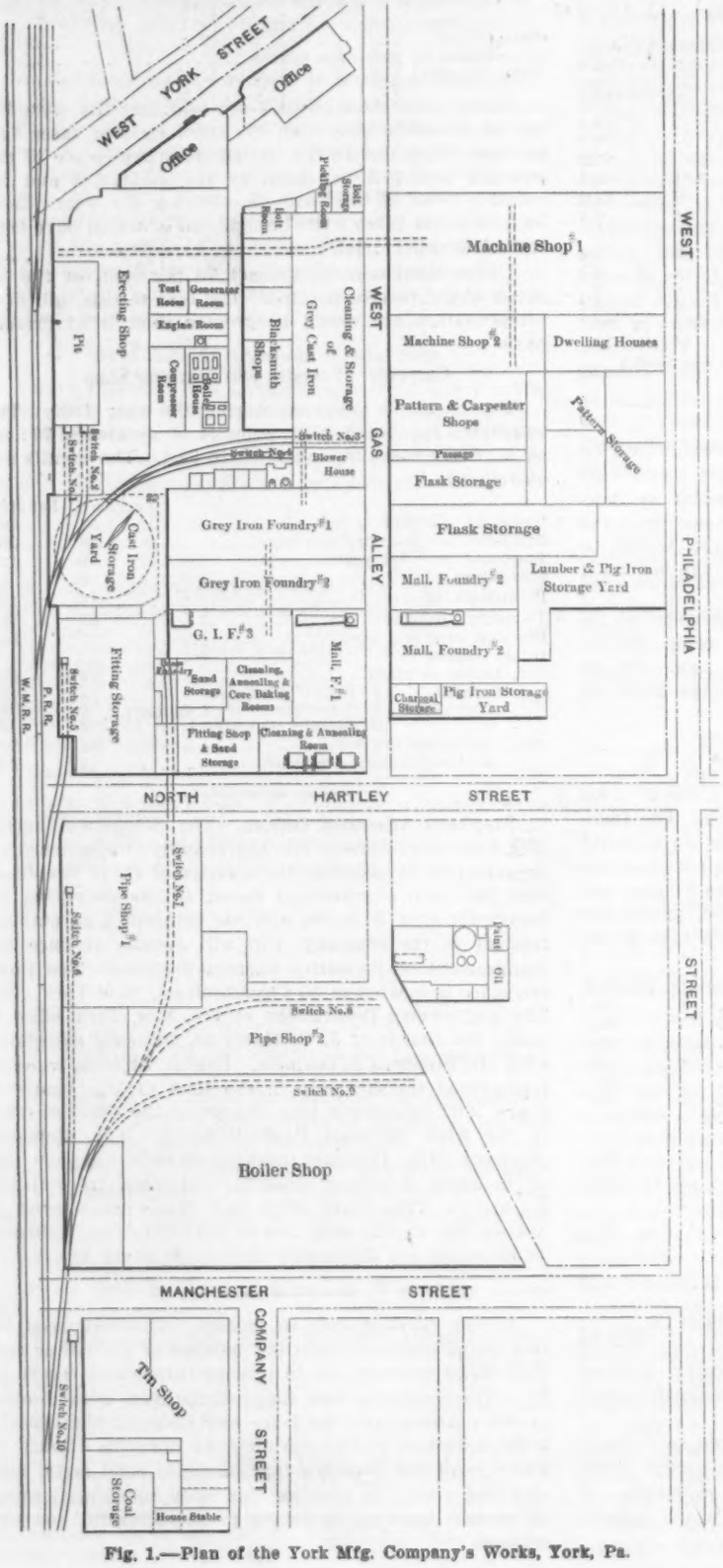


Fig. 1.—Plan of the York Mfg. Company's Works, York, Pa.

The Machine Shops

The locations of the No. 1 machine shop and the smaller No. 2 machine shop which adjoins it are shown in Fig. 1. They are of structural steel frame with brick walls. The work of erecting the structural steel was done by the York Bridge Company; all else was done by the York Mfg. Company, itself or under the supervision of its engineers. The general ground plan of the No. 1 machine shop shows it to be 100 ft. wide by 230 ft. long and three stories high, with a floor surface of about 52,000 sq. ft. Adjoining it is the No. 2 machine shop, 47 x 130 ft., two stories. The No. 1 or main shop is 50 ft. in hight at the center line; in the center it is open for a width of 38 ft., which provides for a crane runway and heavy erecting floor, while the whole width of the shop is devoted to machine work. The second and third story bays on each side of the building are 29 ft. 11½ in. wide, the hight of the ceiling on the first floor being 16 ft.; the second floor, 14 ft., and the third floor, 16 ft. These bays are carried by the structural steel frame of the building, and supported inside the building on 15-in. Bethelehem H shapes, spaced 16 ft. 2 in. apart and resting on 4-ft. square concrete foundation, all piers and footings for foundation walls going down to solid rock. In this construction it will be noted that the girders carrying the floors of the bays are let into the H columns, and that the crane runway at the top of the inner row of H columns is let into and carried on the tops of the columns, the strain therefore being directly on the columns.

FLOOR CONSTRUCTION.

The construction of the various floors is particularly interesting. It was the object in the case of the main floor to avoid all possibility of moisture rising from the bottom; it was therefore built up of 3 in. of concrete, on which was laid two coats of hot tar and two layers of heavy tar roofing paper alternating, starting with the hot tar. On this was an 8-in. layer of concrete, and this finished with a top dressing 1 in. in thickness. The floors

of the second and third story bays have a carrying capacity of 500 lb. live load per square foot of area and are carried on 12-in. channels in pairs, 4 in. apart, and filled with 4 x 12 in. yellow pine timber, bolted through, which in case of fire would serve to prevent the buckling of the channels. On these is laid 2¼-in. yellow pine slip tongue flooring; then two coats of hot tar and two coats of tar felt paper, alternating, and finished with a ⅞-in. factory grade maple flooring.

The bays are connected at each end by a 5-ft. passageway, and are reached by stairways at each end of the building and by elevators. The stairways are built up of 10-in. channels, which are used both for risers and treads; that for the tread is turned up and filled with concrete, which serves as the surface tread. Three Ridgway steam hydraulic elevators of 10 tons capacity, two located at the front and one at the rear of the building, serve all the bays. They have a floor space 5 x 8 ft., and have a steel cage 4 ft. high. A heavy sheet iron plate covers the top, protecting the operator from injury by accidental falling of any material. In order fully to protect employees the elevator shafts are all inclosed with heavy wire screens.

Toilet facilities are provided at the corners of the front end of the shop, four washrooms and lavatories at each corner, which are amply sufficient to accommodate 500 men. Full sanitary equipment is installed.

ROOF CONSTRUCTION.

The roof construction is of 8-in. channels, between which is bolted 4 x 4 in. yellow pine for nailing pieces. The roof boards are of 1¾-in. yellow pine, on which is laid three-ply tar paper, tarred and sanded. It has a fall of 1 in. to the foot. Rain spouts are of copper and cast iron, and pass through the inside of the building, leading direct to underground sewers. The overhead lighting system is by means of the standard type of Drouvé Anti-Pluvius skylights. Fourteen of these, seven on each side of the center line, supply abundant light. They are each 23 x 30 ft., covered with wire glass and have a fall of 2½ in. to the foot.

HEATING AND VENTILATION.

The heating system is of the indirect type. There are 3500 ft. of 1-in. pipe, racked up and inclosed, through which exhaust steam is passed. An American Blower Company fan, taking fresh air from out of doors, forces it over these pipes and through a 4-ft. square main to the top of the building. By means of a Y it is carried to both sides of the building, forced downward from floor to floor and distributed throughout the length of the building in rectangular mains located under the work benches in each bay. In hot weather a circulation of pure air from outside can also be maintained by this system. Top ventilation is furnished by means of 30-in. diameter Pullman ventilators, 14 on the No. 1 machine shop and eight on the No. 2 shop. Industrial railroads connecting the No. 1 and No. 2 shops, together with an extensive system of overhead cranes, serve admirably the first floor of the shops, while the upper floors and bays are served by electric trolleys running the entire length of the building. Transportation service to other departments is by means of a 40-ton electric storage battery truck, running through the main erecting shop and thence to various other departments.

MAIN FLOOR ARRANGEMENT.

The main floor of the No. 1 machine shop, on which the heavy machine work is done, has an area 30 x 230 ft. Two 30-ton Niles electric traveling cranes, each having a 5-ton auxiliary hoist, handle the work from the electric truck to the machines on the main floor, having a clear lifting headway of 38 ft. The arrangement of the tools, as shown in Fig. 2, is such as to enable the most convenient handling of the work. In this department

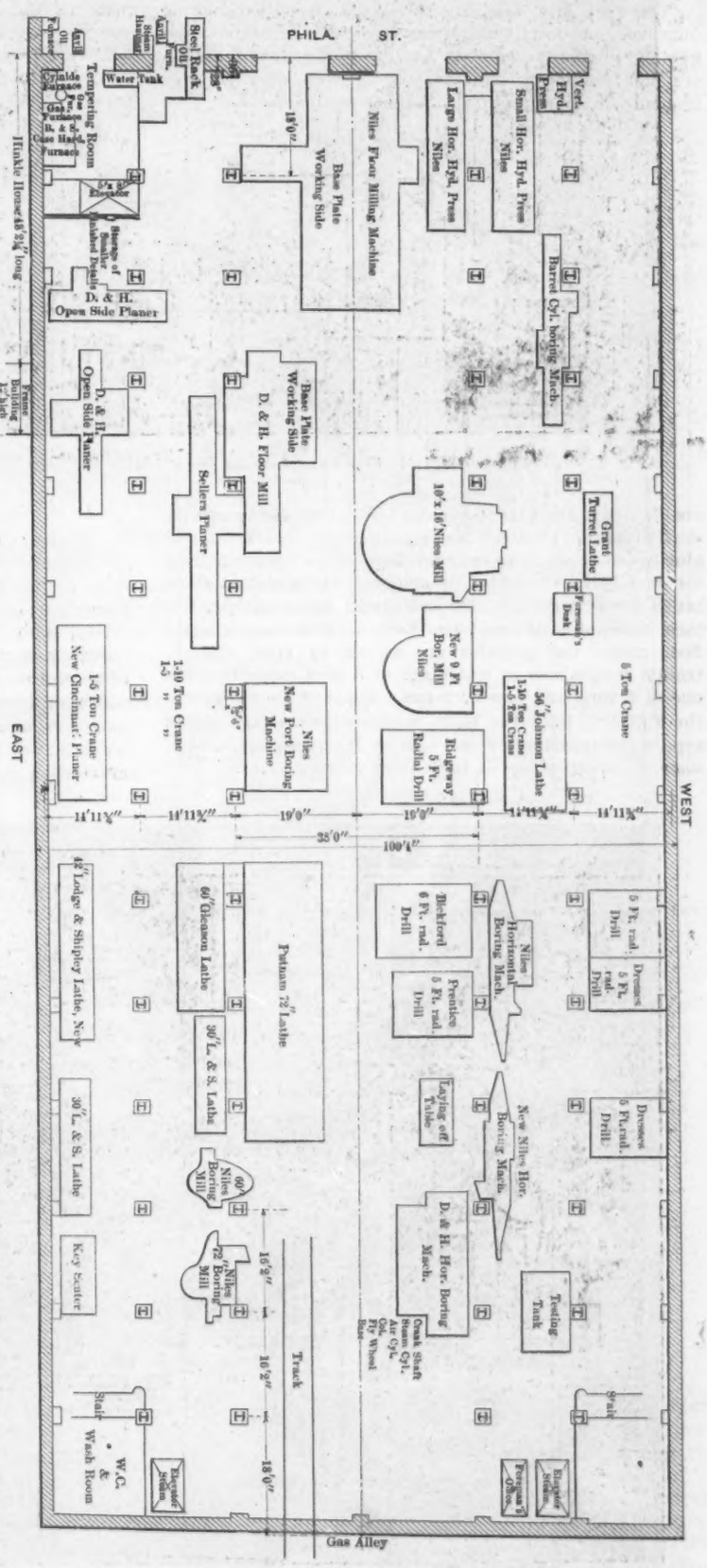

PHILA. ST.
EAST
WEST
Gas Alley
Track
Steel Rack
Water Tank
Tempering Room
Base Plate Working Side
Niles Floor Milling Machine
Vert. Hyd. Press
Large Hor. Hyd. Press Niles
Small Hor. Hyd. Press Niles
Barrel Cyl. boring Mach.
D. & H. Open Side Planer
Base Plate Working Side
D. & H. Floor Mill
Sellers Planer
10' x 16' Niles Mill
Grant Turret Lathe
New 9 Ft. Bor. Mill Niles
Ridgway 5 Ft. Radial Drill
Niles New Fort Boring Machine
1-5 Ton Crane New Cincinnati Planer
5 Ton Crane
36" Johnson Lathe
Pattern Shop
Blanchard Grinder
Foreman's Office
Time Office
Engineer's Office
Shipping Platform
Stair
W. C. & Wash Room
Key Seater
Niles Boring Mill
Niles Boring Mill
Laying off Table
Testing Tank
Crank Shaft Boom Cyl.
Air Cyl.
Fly Wheel Bore
Gas Furnaces
Oil Furnaces
Steam Hammer
Oil Furnace
Cyanide Furnace
Oil Furnace
Oil Furnace
Blacksmith Forge
Oil Furnace
Oil Furnace
Oil Furnace

Fig. 3.—View in New No. 1 Machine Shop, Looking Toward Main Entrance, Showing in Part Machine Tools in Galleries.

are located machine tools for work on heavy crank shafts, steam cylinders, air cylinders, flywheels and engine bases. Under the bays are located the tools handling the less bulky character of machine work, with testing tanks for cylinders, which are tested up to 300 lb. per inch internal pressure. The tools located on the main floor under the galleries are served by eight electric trolley cranes, five of which are of 5 tons capacity each, one of 3 tons and two of 1 ton. Some of these operate the full length of the shop, while others of the swing type serve individual tools. All of the tools on the first floor of the shop are of individual electric drive.

TOOL AND SUPPLY DEPARTMENT.

At the rear of the main floor of the shop, extending 10 ft. under the sidewalk, is located a storage department for templets for drilling machines. These are separately racked and classified, and are furnished mechanics for the class of work to be performed by a system of checking, similar to that employed in tool rooms. In this same section of the shop is the tool making and blacksmithing department, in which are located forges, steam hammers and heating and tempering furnaces for the manufacture of shop tools. An independent system of ventilation is provided for this department. A series

Fig. 4.—Main Floor of No. 1 Machine Shop.—40-Ton Electric Storage Battery Truck in Foreground.

of tool rooms are also located at the rear of the shop. These have 16 x 18 ft. floor space each, 10-ft. ceilings and are located one above the other, so that three tool rooms serve both the main floors and the galleries, although separate tool rooms for small equipment are also located in the different galleries.

THE NO. 2 SHOP MAIN FLOOR.

The main floor of the No. 2 machine shop, having an area of over 6000 sq. ft., which adjoins the No. 1 shop, is used partly for grinding and buffing crank shafts, each tool being equipped with an individual exhaust system to carry off the dust. The rod finishing department is also located on this floor, as is also the cylinder lagging department, which is supplied with the necessary shears, punches, bending rolls, &c. One 3-ton and two 5-ton electric overhead traveling cranes serve this department. The tools which comprise drills, punches, slotters, crank shaft machines, &c., are electrically driven in two groups.

GALLERY EQUIPMENT.

The second floor gallery of the No. 1 machine shop on the east side is used largely for turret lathe work, there being 13 turret machines, while the west gallery is used for small lathe, drill press and miscellaneous work. The tools are driven in two groups with countershaft motor drive. Two 3-ton overhead Shepard Electric Crane & Hoist Company cranes command the east gallery, and there are three 3-ton cranes in the west gallery. The second floor of the No. 2 machine shop, which adjoins that of the No. 1 shop, is used for planer, milling machine and shaper work of various kinds. This department is served by a 5-ton overhead electric crane.

The third floor galleries comprise bench and vise work, including that on crossheads, piston rings and governors. There are also brass working departments on the west side and a tool making department on the east side. In this gallery is located the grinding department, in

Fig. 5.—Central Bent in New Boiler Shop.

Fig. 6.—View Across Boiler Shop at Right Angles to That in Fig. 5.

Fig. 7.—Skylights of No. 1 Machine Shop.

which the internal and surface grinding is done. The tool making department covers a floor space 28 x 72 ft., and is fully equipped with the usual tools required for this work. An overhead bridge, connects these two galleries.

Figs. 3 and 4 are interior views in the new machine shop.

Boiler Shop

The new boiler shop, Figs. 5 and 6, is of irregular shape, measuring in the main portion 333 ft. in its greatest length and 164 ft. in its greatest width, east and west. It is of structural steel and brick construction, the same details being followed in general as in the machine shop. The roof trusses as well as the second floors of the shop are carried on 12-in. H columns, set on 4 x 4 ft. concrete piers, extending down to rock foundations; while for the columns carrying the runways for the overhead cranes 14-in. sections are used. The north wing, extending over the adjoining pipe shop, occupies a ground space of 50 x 110 ft. In the construction of the roof, main concrete floors, stairways and gallery floors, the same methods were followed as in the machine shop. Toilet facilities are also provided on the same liberal basis. A description of this shop can best be given by starting with the center bent, which has a width of 58 ft. 8 in. between columns. A bent on the north and one on the south of the middle bent have a width of 45 ft. 5 in. Each of these three bents is 163 ft. in length, and the hight is 45 ft. along the center line of the building. Generally speaking, the width of the building is the working length of each of these bents. To the north of the right center bent the floor area of the shop, which is irregular in shape, measures 133 ft. 7⅛ in. by 164 ft. by 48 ft. 5 in. by 203 ft. 2 in., and over this is a gallery of the same dimensions. At the south end of the building the floor space is also of irregular size, 50 x 163 ft., with a wing 52 ft. 1 in. by 112 ft. 9¼ in., extending partly over the yard and the adjoining pipe shop. Over this is a gallery of the same dimensions, the floors being carried on H columns, except that portion extending over the yard, which is supported by an inverted truss; so as to provide for the transportation of freight by means of a spur from the railroad siding entering the building at the southeast corner and running along the entire east side of the shop.

CRANES, LIGHTING AND HEATING.

Each of the three main bents of the shop is spanned by an overhead electric traveling crane, the center one being of 20-ton Morgan crane, and the other two 20-ton Shaw cranes. These handle material directly from or to cars on the track along the side of the shop. For the galleries at the ends are 5-ton Otis' electric elevators, inclosed and fully protected in the same manner as those in the machine shop. The same scheme of heating and ventilating is followed, though the various heating ducts are larger. In addition to windows in the side walls, Drouvé Anti-Pluvius skylights oof the standard type are located in the roof. Over the center bent are eight 16 x 20 ft. and four 12 x 20 ft. skylights; over the right and left center bents, four 16 x 36 ft. and two 12 x 36 ft. skylights, while over the north and south galleries the same number and of the same size. Eight additional lights of various sizes are located in the roofs of the irregular wings at each end of the main shop. For overhead ventilation are 19 30-in. Pullman ventilators along the ridge of the roof. The skylights of the new shops are shown in Figs. 7 and 8.

ARRANGEMENT OF TOOLS.

The main floor of the middle bent is devoted to heavy plate work. On each side between the columns are the punches, shears and other tools for bending, drilling and planing. In addition to the general traveling crane service, many of the tools are served by individual 3 to 5 ton jib cranes, hung from the columns and supported at the base in some cases by the frames of the tools them-

Fig. 8.—Arrangement of Drouvé Skylights on Boiler Shop Roof.

selves. In the right center bent are facing machines and testing machines, with pumps for testing purposes; in the left center bent are lighter tools, including hydraulic riveters, operated by electrically driven pumps, rivet heating furnaces and pneumatic tools of various types. Under the south gallery is the department for welding, the oxy-acetylene system being extensively used. Each bent is equipped with a 3-ton electric crane. Under the north gallery are located the smaller shop tools for general machine drilling, cold sawing and other operations. The main floor tools have individual motor drives. Fuel oil is used for the rivet heating furnaces.

The south gallery is given up largely to storage, particularly for ice cans, it being necesary to carry large stocks of various sizes. The north gallery is used for machining and fitting up in connection with the pipe department, and is provided with lathes, planers, drilling machines and pipe cutting tools. The tools are electrically driven in groups. In this department there are four 3-ton electric cranes. There are tool rooms, wash rooms and lavatories at each end of the building.

While this shop is called the boiler shop, it is in reality a group of shops working on product which calls for a certain amount of sheet iron or boiler work.

HANDLING IN AND OUT.

A track runs through the length of the east side of the shop so that cars can be loaded and unloaded with any one of the cranes. The sheet material is received in the center bent where it is laid out, sheared, punched, planed and formed. Material which is to be welded up or used in the welding department goes to the south bent, where all the tools and apparatus needed to form, weld, face off and test this class of work are located. Here it is finished up, tested and placed on the cars and shipped.

The material which is to be riveted up goes from the center bent to the north bent. Here it is riveted up, caulked and finished, tested and placed on the cars and shipped. Thus there is no interference or crossing of the work in course of manufacture.

In the south bent there is a 3-ton electric crane between each line of posts. These cranes run under the gallery and can receive and deliver material to be welded from and to the south bent, and thus are feeders to this main bent.

Under the north gallery the cranes run the same way as those in the main bents. This is for the reason that the work done here is principally that of building cranes used in ice plants, the beams for which are placed in racks along the west side of the shop under the gallery. The finished work is placed directly upon the cars without going back into the main bent.

Every effort has been made to reduce the labor of handling and finishing, by introducing labor saving devices and by routing the work so as to reduce handling. Thus the capacity of this department of the works has not only been increased 300 or 400 per cent., but the cost of manufacture has been materially reduced.

Improvements in Other Departments

Besides building the two new shops, the York Mfg. Company has made improvements throughout its plant. What was formerly a combination machinery and erecting department is now used for erecting only. An erecting pit, Fig. 9, 40 ft. wide and 150 ft. long, has been constructed in the No. 1 shop. This is served by two cranes, one of 25 tons and the other of 35 tons capacity. No. 2 shop has two 5-ton, one 10-ton and three 8-ton; No. 3 has two 5-ton and two 3-ton cranes. All these cranes are electrically driven.

The erecting department is equipped with all needed stationary and portable tools to finish up machines after they have been set up and marked, thus avoiding the necessity of returning any part of the work to the machine shop.

Fig. 9.—Rearrangement of Pit in Erecting Shop.

The shop formerly used as the boiler shop is situated between the erecting and machinery departments. It abuts the foundry and has been turned into a casting cleaning and casting storing department by running a track into the foundries through an opening made in the dividing wall. Thus the foundry department has gained as molding space that formerly used for cleaning, and the routing of the castings has been changed so as to reduce the handling.

The cleaning and storing shop has a 40-ton Shaw crane, which delivers the castings to the electric track mentioned above. The latter conveys them either to the machinery or the erecting department. The crane operator and the truck operator thus do the work formerly requiring a gang of laborers. The advantage is marked in the winter season, as now the castings are under roof, whereas they were formerly out in the weather. The difference in cost of handling under these conditions can be appreciated.

The improvements referred to in this article were begun in January, 1909. The machinery department was ready to receive its tools in September, 1909, when the work of moving the machine tools was begun. The boiler

shop was ready to receive its equipment June 1, 1910, when the moving of the tools was begun. Each tool was put in perfect working order before being started up in its new position.

Economies Secured

This radical and costly reconstruction was compelled by congestion, due to a phenomenal growth of the business. The point was reached where increased business meant increased cost, hence it was necessary to either reduce the volume of business or resort to the heroic measure of greatly increasing the plant. That the plan followed was effective is shown by this fact: The actual overhead expense in the year ending September 30, 1910, showed such a reduction that the allowance made for overhead expense, based on that of 1908, has more than absorbed the total cost of moving, cleaning and repairing the tools, putting in new foundations where needed, setting and connecting up the tools ready for operation, repairing the floors and other parts of the shops from which the tools were taken; in fact, everything which was not actually an addition to the plant.

The volume of work done in this plant was practically the same for each year of the last three, hence the reduction in overhead cost can only be attributed to the betterment of the equipment brought about by the additions and improvements. The plant as it now stands is considered one of the most modern and up-to-date for its class of work in the country.

Before the changes described the company employed about 1250 men. It is now estimated that the output can be doubled with an addition of 750 men; that is, with 2000 men the company can turn out twice as much product as it formerly did with 1250 men. This would mean the saving of 500 men.

The Ingersoll-Rand and Cameron Pump Alliance

A most interesting circular has been issued regarding the purchase by the Ingersoll-Rand Company of a controlling interest in the A. S. Cameron Steam Pump Works. Following are some extracts:

One of the strongest connections of kindred industries recently effected is that of the Ingersoll-Rand Company and the A. S. Cameron Steam Pump Works; the former having purchased a controlling interest in the latter, yet the connection between these two companies cannot be looked upon as a merger in any sense of the word. The A. S. Cameron Steam Pump Works will continue under the management of Geo. W. Fuller as in the past, and there will be no change in the policy of the company, but a greater expansion is contemplated.

Quite a romance might be woven about this alliance, since each company had its origin at nearly the same time and in the same building nearly half a century ago, and for some years, in their early history, carried on their respective manufacture under the same roof, Second avenue and East Twenty-second street, New York City. The acquaintance thus began ripened into a close and enduring friendship, and a community of activities and interests; the Ingersoll-Rand Company acting as the representatives for the sale of Cameron pumps in some of the leading cities at home and abroad, chiefly in Texas and Mexico, and along the border, and in South Africa, where their success was phenomenal; while the Cameron Works for many years made the castings for Ingersoll compressors and until the latter company removed from the city and built its own foundry.

A history of each company is given. In connection with that of the Cameron Works, the announcement is made that the plant in New York City, though ample at first, is now inadequate for its rapidly growing business. This disadvantage will, however, soon be overcome, as it is the intention to move out of town and to far more commodious quarters, where every facility will be afforded to continue the manufacture under better auspices and ample provisions for further growth and development.

E. N. Breitung & Co., Rockefeller Building, Cleveland, Ohio, have issued a booklet giving cargo analyses of 1910 shipments of their ores with guarantees for 1911. Three Bessemer ores are listed—Foley and Foley No. 2 from the Marquette range and Algoma ore from the Michipicoten range in Ontario. There are 11 Marquette non-Bessemer ores and four Marquette and one Menominee siliceous ores.

The Triple and Trinity Gaskets

The Cincinnati Gasket & Packing Company, 1536 Plum street, Cincinnati, Ohio, is manufacturing two new types of gaskets. The object in making these two gaskets is to produce one which will not stick to the joint when the latter is broken for repairs, and also one that can be used over and over again. Fig. 1 is a view of the Triple gasket and Fig. 2 is a view of the Trinity gasket.

The Triple gasket is so called because there are three layers of material in it, two of which are metal placed on either side of a layer of asbestos or other packing material. In the types of gaskets now on the market for packing seams and joints in steam, hot water and other fittings, one of the surfaces presented to the ends of the joints is asbestos, rubber or some other packing material which in use adheres to the joint, so that when it is broken for repairs or other purposes the gasket is destroyed. With a view to overcoming this difficulty two metal sheets forming a sheath are used, and in this space is placed a layer of asbestos or other packing material. One of these metal sheets is provided with metal flanges, which entirely surround the other sheet.

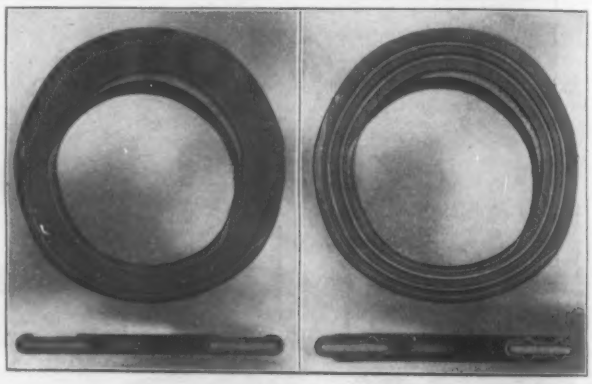


Fig. 1.—The Triple Gasket. Fig. 2.—The Trinity Gasket.

Two New Gaskets Made by the Cincinnati Gasket & Packing Company, Cincinnati, Ohio.

This feature is clearly shown in the section in the lower part of the engraving.

The Trinity gasket shown in Fig. 2 is designed as an improvement on the Triple gasket as it provides a gasket possessing more resiliency and elasticity than the ordinary types, and consequently one that is more efficient where great variations of temperature are met with or the parts are subjected to vibration. This gasket consists of two annular sheets of pliable metal, such as steel or copper, one of the sheets being slightly narrower than the other. Both the sheets are corrugated concentrically with their edges, the corrugations being convex, with a broad, flat surface intervening. A layer of asbestos or other packing material is placed between the two sheets and in assembling the edges of the wider metal sheet are turned over to overlap the narrower one and the layer of packing, which is thus entirely surrounded by metal. When assembled the gaskets, therefore, present as the bearing surface for the joint two pliable metal sides, each of which has corrugations separated by a broad, flat surface, a construction which gives great elasticity as well as the requisite contact area.

Robert W. Hunt & Co., engineers, Chicago, recently issued pamphlets entitled "The Inspection of Rails for Street and Interurban Railways," and now find an annoying typographical error to which they call attention. The pamphlets contain the recommended specifications as adopted by the Committee on Way Matters of the American Street and Interurban Railway Engineering Association at Atlantic City, October 11, 1910. The error occurs on page 6, section 4. This paragraph relates to the chemical composition, and the proper limits for the carbon content should be 0.60 to 0.75 and not the limits as shown in the pamphlet.

The Weaver Roller Jaw Chuck

High speed steel is being used more than ever before, and one result of this increasing use has been to augment the strain to which drills and reamers are subjected in operation. This increase in the stress has led users to secure the strongest possible construction for the shanks of these tools as well as for the holders for them. There are a number of chucks now on the market, but one recently brought out by the Weaver Mfg. Company, Springfield, Ill., is said to possess a combination of advantages such as none other has. Among its special features are its adaptation to straight shank tools exclusively, thus eliminating the taper shank drill having tangs to twist off; polished steel roller jaws which grip the shank powerfully and yet at the same time do not mar it; its entire freedom from delicate or complicated mechanism, and a wide range of capacity. The chuck possesses three principal parts—a body, a cage and the three roll jaws which are shown respectively in Figs. 1, 2 and 3, while Fig. 4 is a diagram illustrating the manner in which the jaws engage the drill shank and increase their grip as the resistance of the drill increases.

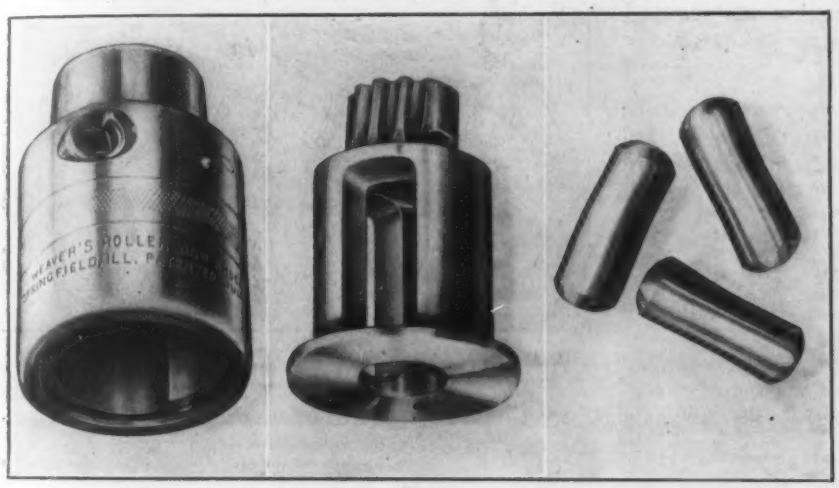


Fig. 1.—The Body. Fig. 2.—The Cage. Fig. 3.—The Roll Jaws.

The Three Parts of the Roller Jaw Chuck Made by the Weaver Mfg. Company Springfield, Ill.

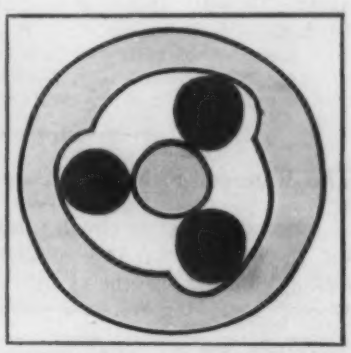


Fig. 4.—Diagram Showing Principle Upon Which the Weaver Roller Jaw Chuck Operates.

The chuck body, shown in Fig. 1, is made from a solid piece of hardened, ground and polished steel. The thickness of the walls and the construction of the interior cams against which the roll jaws bear are clearly shown in the engraving. The body is said to be free from any tendency to damage through either use or abuse, and the highly finished exterior surface will not become marred by careless handling.

Like the body, the cage, Fig. 2, is also made of a single piece of hardened steel. As will be noticed from the engraving, the construction is very simple. This cage contains and controls the rolls, and together with them can be instantly removed for cleaning by simply extracting the locking pin. This pin is the only means employed to secure the entire mechanism of the chuck in position.

The three roller jaws which are of hardened tool steel ground and polished are shown in Fig. 3. They transmit all the strain of driving to the heavy one-piece body by bearing against the internal cams. The smooth finished surface will not mar or deface the drills no matter how great the pressure to which they are subjected, and there are no sharp jaws to cut and scar the drill shank which would be apt to ruin the tool and cause it to run out of true.

In Fig. 4 the principle upon which this chuck operates is shown. The outer rim is the body of the chuck, and the three cam faces which comprise its interior wall and upon which the rolls operate is clearly shown. The center circle is the drill shank, and the three surrounding ones represent the roller jaws. When these are brought into very light contact with the shank of the drill, the grip of the jaws automatically tightens as the resistance of the drill increases due to the tendency of the latter to force the rolls farther up the faces of the cams.

Another special advantage of this chuck is that broken tang drills can be used up by simply turning down their taper shanks. In this way it is possible to use up taper shank drills which are frequently discarded as soon as the tangs twist off because of the cost of adjusting a lathe and turning a new taper shank. In adapting these drills for use in the Weaver chuck all that is necessary is to have the lathe take a cut parallel to the cutting edge of the drill as no particular size or finish is required.

The chuck can be used with either a stationary or a portable drill, and is made in three sizes. The smallest will take drills from 1/8 to 5/8 in. in diameter and meets the demand in most shops for the smaller sizes of work. The medium size accommodates drills ranging from 5/8 to 5/8 in. in diameter as well broken tang drills having either Nos. 1 or 2 taper shanks. The largest size of chuck takes straight shank drills ranging in diameter from 5/8 to 1 in. as well as those having Nos. 2, 3 or 4 taper shanks.

The Merchant Marine Congress.—The Merchant Marine Committee of One Hundred, acting under the auspices of the National Association of Manufacturers, has called a National Merchant Marine Congress to meet at the New Willard Hotel, Washington, D. C., January 23 and 24. Attention will be focused upon a single object, namely, the passage of an ocean mail measure by the present Congress; consequently, all collateral questions, such as construction subsidies, free ships, discriminatory duties and the like, will be excluded from discussion. It will urge Congress to pass without further delay an ocean mail bill, which will authorize the Post-Office Department to apply the revenues received on account of foreign postage toward securing ocean mail service in American built ships flying the American flag and available in time of need for naval use with those regions where ocean mail facilities are now most inadequate, namely, South America, South Africa, Australasia and the Orient. D. A. Tompkins, president of the committee, is a large manufacturer of Charlotte, N. C. A number of the leading Chambers of Commerce will send delegates, and so will important national associations of manufacturers.

The Newark Technical School, Newark, N. J., is having a new laboratory building erected in which the faculty expects to open a course in tool making and tool designing. In addition to instruction in the designing and making of small tools, mechanical drawing will be taught and a course in metallurgy in iron and steel will be offered the pupils. The students in the latter course and in the tool making course will be required to attend seven hours a day for five days in the week and four hours on Saturday. Four hours of each day's instruction will be devoted to practical work in the mechanical laboratory and the remainder of the time will be given over to drawing and academic work.

The Morris 20-In. Cone Head Lathe

A New Tool with a Special Type of Drive

A new 20-in. cone head lathe with an 8-ft. bed has been brought out by the John B. Morris Machine Tool Company, Cincinnati, Ohio. One of the principal features of this new tool is a peculiar method of driving through a three-step cone pulley and a double back gear. In this drive the double back gear keyed to the cone pulley meshes with the sliding gears on the back gear quill, and the pinion on the back gear quill meshes with the face gear keyed to a flange on the spindle on the outside of the front bearing. Fig. 1 is a general view of the tool, while Fig. 2 is a sectional plan of the headstock, showing the arrangement of the gearing.

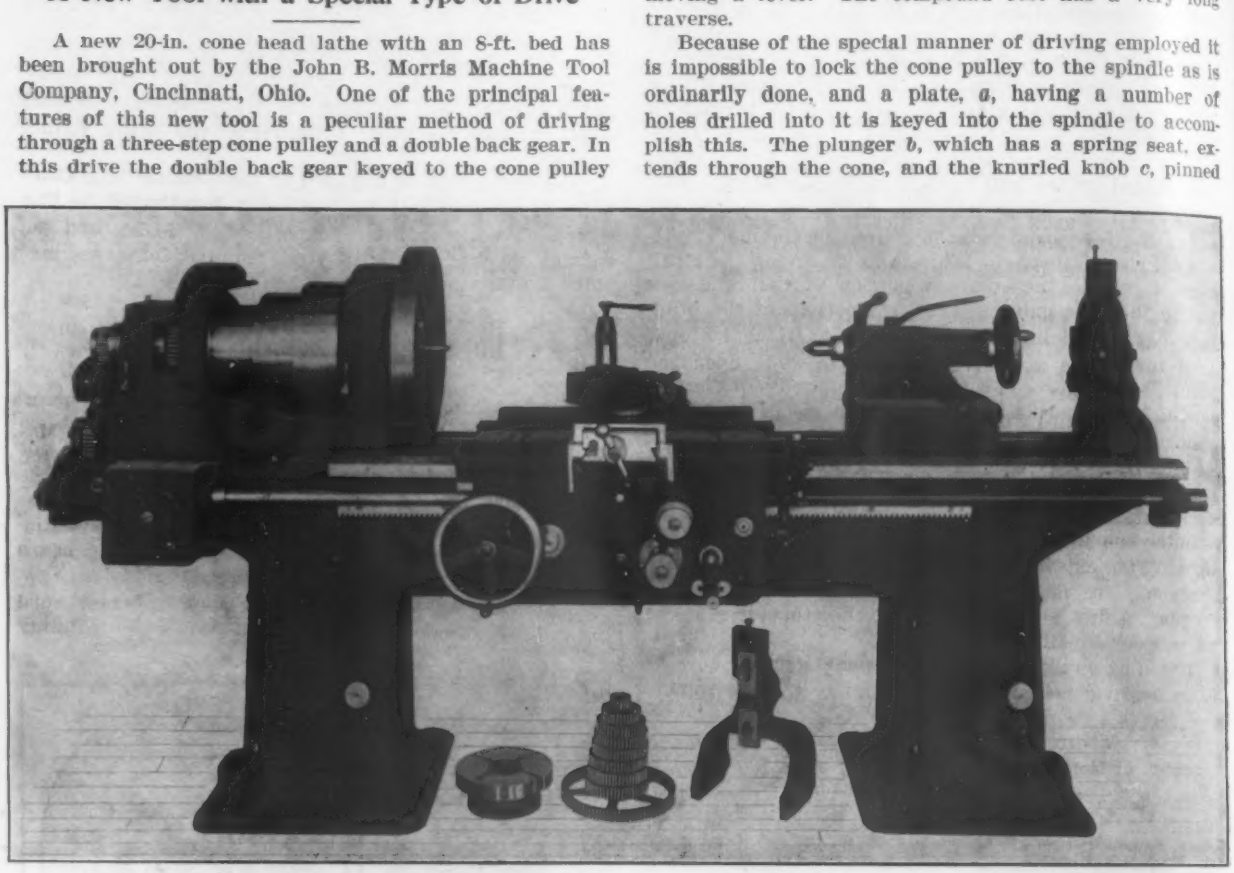


Fig. 1.—The 20-In. Cone Head Lathe Built by the John B. Morris Machine Tool Company, Cincinnati, Ohio.

The headstock is long and massive and entirely incloses the face gear. The reverse plate is located on the outside of the headstock, thus avoiding the necessity for coring out the web to make room for this part. The tailstock is also of massive construction and can either be bolted solidly to the bed by two heavy bolts or extended over the end when long pieces of work are being handled.

Like all the other modern tools of this type, the apron has double walls, and double support is provided for all shafts subjected to severe strains. The lever below the apron, Fig. 1, gives a positive feed for rough chasing all threads with the ordinary rack feed, thus preserving the lead screw threads for finishing. The rack and screw feeds are both kept out of engagement at the same time, and provision is also made for reversing the cross and the longitudinal feeds in the apron. There is a chasing dial for catching all the threads, which range from 2 to 72 per inch, including an 11½ pipe thread, without stopping the lathe or reversing the lead screw. The semiquick change gears render three changes of feed available for every change of gears. These feeds range from 0.005 to 0.5 in. per revolution of the spindle and are secured by moving a lever. The compound rest has a very long traverse.

Because of the special manner of driving employed it is impossible to lock the cone pulley to the spindle as is ordinarily done, and a plate, *a*, having a number of holes drilled into it is keyed into the spindle to accomplish this. The plunger *b*, which has a spring seat, extends through the cone, and the knurled knob *c*, pinned to the left end of the plunger with the retaining pin *d*, keeps the plunger out of engagement with the holes in the plate *a* when the back gears are in use. This knurled knob is operated by hand through an opening in the gear cover.

Both the front and rear headstock bearings are tapered and provided with ring oilers, and the boxes for the spindle and the headstock are of the same type as

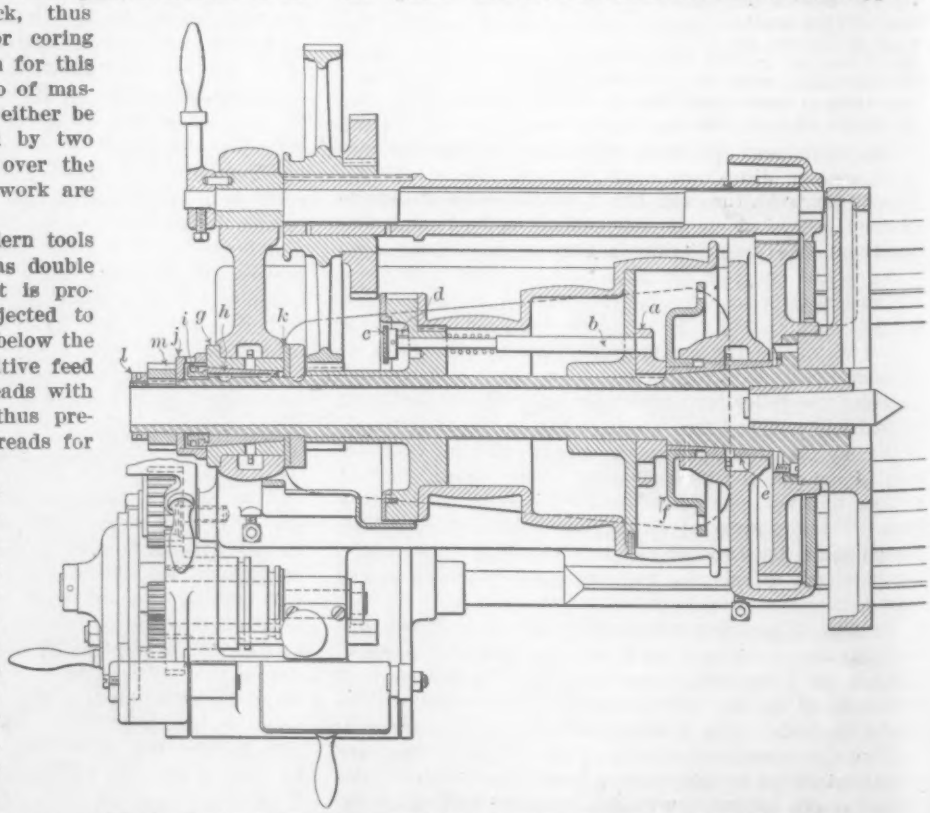


Fig. 2.—Sectional Plan of the Headstock, Showing the Arrangement of Gearing.

that used on the 16-in. geared head lathe, an illustrated description of which appeared in *The Iron Age* January 12, 1911. The means for making adjustments for wear are the same in both types of lathes and the spindles of both are interchangeable. The headstock boxes are not capped, but are solid bearings bored to the same size. The bronze sleeve *e*, the bore of which corresponds to the spindle taper is fitted into the front bearing with a light driving fit and keyed to keep it from turning in the headstock. A left-hand thread is cut on its inner end to receive the adjusting nut *f*, which has a right-hand thread on the hub to fit into the headstock. This nut has a large flange which is drilled to receive the pins of the face spanner wrench used in making adjustments. This adjustment is made by removing the small cover shown on the enlarged portion of the headstock next to the cone pulley. The back portion of the headstock has a bushing, *g*, driven into it, which is taper bored to receive a sleeve, *h*, keyed to slide upon the spindle. This sleeve can be moved longitudinally on the spindle by the adjusting nut *i*, which is operated by a spanner through holes in the thrust cup casting *j*. The hardened tool steel washer *k* opposes the natural thrust exerted by the spindle in operation, and the spindle is prevented from moving longitudinally by the nut *l* on its outer end and the feed gears *m*, bearing against the cup *j*. This cup has its bearing against the rear headstock box. In making adjustments of the spindle, the end play is first adjusted and then the front or the rear box can be adjusted independently.

The high grade crucible steel spindle has a bore of 1⅝ in. and its nose is 3½ in. in diameter. The spindle nose serves as a pilot for the face plate or chuck plates which screw directly into the face gear. The largest diameter of the front spindle bearing is 3⅝ in. and it is 5⅛ in. long. The three steps of the cone pulley are arranged for a 4-in. belt, and the double back gear gives ratios of 4.4 to 1 and 18 to 1. The speeds are arranged in geometrical progression.

The following table gives the principal dimensions and specifications of the lathe:

Swing over ways, inches	20¾
Swing over carriage, inches	12⅛
Length of bed, feet	8
Regular distance between centers, inches	53
Maximum distance between centers, inches	58
Bore of spindle, inches	1⅝
Diameter of spindle nose, inches	3½
Maximum diameter of front spindle bearing, inches	3⅝
Length of front spindle bearing, inches	5⅛
Width of driving belt, inches	4
Ratio of back gears	4.4 to 1 and 18 to 1
Range of threads, per inch	2 to 72
Size of tool post opening, inches	⅝ x 2
Diameter countershaft friction pulleys, inches	14
Face width of countershaft friction pulleys, inches	4
Net weight of tool, pounds	3,700

The equipment furnished with this tool includes face plate, change gears, wrenches and all the other customary accessories, as well as a countershaft with double friction pulleys which enables both belts to be run forward, as no reversing belt is required.

The Girod Electric Furnace

Concerning recent progress with the Girod electric furnace, the following statement is made by its representatives:

At one plant in Ugine, France, six Girod furnaces are now in operation. Two of these are refining up to 16 tons each of cold charges of ordinary scrap material, and recently in the presence of the controller of the French Navy one of the furnaces made a heat of 18 tons of steel for castings. Cold charges are used exclusively, but with molten metal these two furnaces could take charges of 20 tons. The power supplied is 1200 to 1500 kw. and each furnace is provided with four electrodes. Two other furnaces at this plant, with a capacity of 3 tons of cold or 4 tons of molten charges, are each operated with a single electrode. The power capacity is 325 to 350 kw.

Two furnaces each having a capacity of 2 tons are also in operation at this works. The output is high speed or tool steels, projectile steel and steel for castings, automobiles, &c. A new 8000-kw. power furnace is now being installed at Ugine. The Girod Company has 40 other furnaces operating exclusively on ferroalloys.

The Cockerill Company in Seraing, Belgium, has been operating a Girod furnace of 4 to 5 tons for the past two years in refining molten Thomas steel for rails, locomotive tires, cannons and automobiles, and at the Krupp works a 12½-ton Girod furnace, operated with three-phase current, will be used for the production of tool steel, castings, cannons, automobiles and other Krupp product.

The Girod furnace installed by the Simonds Mfg. Company at Chicago last year is being transferred to this company's new plant at Lockport, N. Y., to be used for refining the high grade of steel required for saws, machine knives and files.

The Stirling Packing Machine

Hand packing, which is the commonly accepted manner of packing the stuffing boxes of condensers, possesses the objections of slowness and expensiveness, and is not altogether satisfactory. With a view to overcoming these objections Robert R. Stirling, 847 Avenue C, Bayonne, N. J., has invented an automatic machine for inserting and packing the lacings or strings in the stuffing boxes for the tube ends of surface condensers.

The machine consists of a rotatable hammer tube with a helical slot and guide hook. Power for rotating

A New Type of Machine for Packing the Stuffing Boxes for the Tube Ends of Surface Condensers Invented by Robert R. Stirling, Bayonne, N. J.

this hammer tube is transmitted to it by the compressed air motor at the right, the quantity of air consumed being very small. In fact, when the machine is used with connection with other pneumatic tools supplied from the same reservoir the amount is said to be negligible.

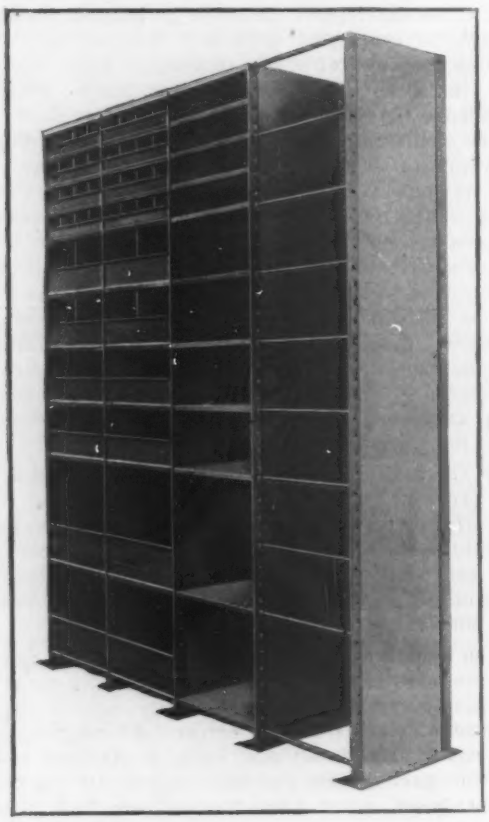
In operation the machine places and starts the end of the lace in the bottom of the stuffing box and then automatically winds the lacing about the tube and hammers in each coil. Each of these coils is perfectly flattened and wound tightly against the tube, thus keeping it out of the threads for the ferrule. The operation of the machine is entirely automatic, and a lace is inserted and packed in from 2 to 3 seconds. The condition of the tubes and stuffing boxes, the position of the work and the ability of the operator all affect the number of boxes that can be packed in a given time. The average in ordinary work is from 6 to 9 boxes per minute throughout the day, which gives a total output of from 2500 to 3000 boxes per day, these results having been obtained under actual working conditions that included breathing and resting spells and time for erecting scaffolding. The machine is regularly equipped with a hammer tube to fit either ⅝ or ¾ in. stuffing boxes, but as these tubes are interchangeable it is possible to pack all sizes of boxes with one machine.

The Treadwell Construction Company, Midland, Pa., recently received a large contract for sugar mill equipment for shipment to Cuba. During 1910 this company built 80 ladles for open hearth and blast furnace use, having capacities of 60 to 80 tons. It is now operating its plant to about full capacity on a variety of heavy plate work.

The Twentieth Century Steel Stock Rack

The increasing use of fireproof construction for manufacturing and storage buildings has created a demand for some material other than wood for shelving and bins and racks. In addition to the employment of a different material these racks must possess other features tending toward economy, especially in the storage of machine parts and miscellaneous stores. The Twentieth Century steel stock rack, made by the Manufacturing Equipment & Engineering Company, Boston, Mass., is said to possess a number of advantages, such as ease in varying the distances between shelves and the sizes of bins, interchangeability, large carrying capacity, stability, resistance to fire, ease in changing from one location to another and ease and comparative low cost of construction.

The uprights or main partitions are made of a light



The Twentieth Century Steel Stock Rack Made by the Manufacturing Equipment & Engineering Company, Boston, Mass.

gauge metal sheet bound at either end by one of heavier gauge that is formed into a triple V and forced on the central sheet. This binding is punched throughout its entire length with holes spaced 3 in. on centers for the truss bars, as shown at the right of the engraving. The burr produced when these holes are punched is carried through the central sheet, thus making the latter and the stiffening edges on either side integral. The load is supported by the truss bars, which are bolted into the punched holes in the reinforced edge and transmit the stresses to it. In addition, these edges also carry the backs and fronts of the bins. Any width of partition can be made, but the customary ones are 18, 24, 30 and 36 in. The spacing between the partitions depends on the length of the truss bars.

Tubing is used for the construction of the truss bars, which carry braces or knees riveted on either end. Holes are drilled through the free flanges of the knees to receive bolts. These bolts pass through the knees on truss bars, and the uprights of the frame thus tightening and bracing up the whole rack, the knees acting as a reinforcement to the main joint. The bolts employed are of the ordinary type and can be tightened with a spanner wrench, a feature which enables the shelves to be changed with ease. These bars are regularly furnished in lengths of 24, 30 and 36 in. for supporting various loads of material of different characters. A set of these bars in position is shown in the right section of the rack illustrated.

Supported on the truss bars are the shelves, shown in the second section from the right end, which are made in any of the customary gauges to carry the load. All four sides are flanged, and in addition, the front and rear edges are trussed, thus allowing a light sheet to support a heavy load. In moving these shelves and the front and rear supporting bars from one set of holes to another it is not generally necessary to remove any other shelf. Holes are pierced in the shelves for taking a card holder on the front and dividing partitions, which fit either transversely or longitudinally in punchings on the shelves. These partitions are hemmed on the front and back edges to remove the sharp edges and also to stiffen them. The tops and bottoms are flanged for bolts which pass through and secure the partitions to the shelves.

The bin fronts are formed to hook under the shelves and can be swung into place readily. They are flanged on each end and are kept in place by bolts passing through these flanges and the uprights. To enable these fronts to be used as a ladder the upper edge is trussed and left very broad. These fronts can be supplied for any of the customary hights of bins, and they can be readily taken on or off. Although not regularly furnished backs can be supplied for the shelves when ordered. Like all the other parts they are flanged on either edge and pierced to receive the bolts holding them fast to the shelves. The left half of the rack is a typical arrangement of shelves, bin fronts and card holders.

United States Petroleum Production in 1910

The year 1910 has been sufficiently eventful in the development of new oil supplies in the United States to more than keep up the country's phenomenal production of the last three years. In fact, the production increased to over 200,000,000 barrels, which is two-thirds of the world's production and several million barrels more than the whole world produced seven years ago.

The most surprising developments of the year were in the Sunset-Midway district of California. The developments in the Caddo field of Louisiana also entirely changed the position of that field. Connected with the developments in both these fields were important changes in the conditions of marketing the oil.

The production of oil in the United States in 1910, as reported by Dr. David T. Day of the United States Geological Survey, was between 200,000,000 and 208,000,000 barrels, approximately, as follows:

	Barrels.
Illinois	32,000,000
Appalachian and Lima-Indiana fields	32,000,000
Gulf and Caddo fields	14,000,000
Mid-Continent and Rocky Mountain fields	53,000,000
California	73,000,000
Total	204,000,000

Stocks increased over 50 per cent. on the Pacific Coast. Prices of crude oil declined except in the Mid-continent field, where they increased to 44 cents a barrel.

Dearborn Feed Water Treatment Abroad.—The Dearborn Drug & Chemical Works, McCormick Building, Chicago, which has distributed its feed water treatment and lubricants through an agency in the Philippines for the past two years, has decided to open its own branch office and warehouse in Manila. F. O. Smolt, who has been connected with mining propositions since his graduation in chemistry from the University of Illinois in 1891, has become connected with the Dearborn Company, and sailed January 7 for Manila to take charge of this work, under the supervision of E. C. Brown, manager of the foreign department of the company. Mr. Brown has spent most of the past two years in Japan, China and the Philippines, investigating steam plant and railroad conditions in the interests of Dearborn products, and is still there, having made selling connections at Tokyo, Tientsin, Hongkong and Shanghai.

An Interesting Labor Inquiry

Recent Immigrants in the Iron and Steel Industry

BY W. J. LAUCK.

A valuable report upon labor conditions in the iron and steel industry is now being published as the result of the extensive investigation made by the United States Immigration Commision. This investigation covered iron and steel manufacturing in all its aspects in the territory east of the Mississippi River. Detailed information was secured for 86,000 employees of the industry, and an intensive study was made of 2500 families the heads of which were employed in iron and steel manufacturing establishments. In the tabulation and presentation of these data the results are first shown for the industry as a whole, followed by general surveys of conditions in the East, Middle West and South. The section of the report dealing with conditions in the East also includes an exhaustive study of the Pittsburgh and Youngstown districts, and in the section on the South separate and detailed treatment is given to the Birmingham district. These divisions of the report render possible a comparison of wages and conditions of employment which prevail in different parts of the country.

Employees Mainly of Foreign Birth

In the industry as a whole it was found that almost three-fifths, or 57.7 per cent., of the total number of employees are of foreign birth, while 13.4 per cent. are of the second generation of immigrants or of native birth but of foreign father. Only slightly more than one-fourth, or 28.8 per cent., of the iron and steel workers are native Americans. Native Americans and immigrants from Great Britain, Germany and northern Europe were exclusively employed until the early part of the decade 1880-1890. During the past 25 years the greater part of the labor forces for the industry has been recruited from recent immigrant races from southern and eastern Europe. Of these races, the Slovaks, Poles and Croatians are employed in the largest proportions at the present time, although all races of recent immigration have a representation in the operating forces of the blast furnaces and steel mills. The old immigration from Great Britain and northern Europe is represented chiefly by the English, Irish and Germans, although considerable numbers of Swedes are employed in the sheet and tin plate establishments and of Bohemians in foundry and machine shops.

The southern and eastern Europeans, unlike the races of older immigration, have had little experience or training in their native countries for the work in the iron and steel manufacturing establishments. Of the total number of employees of foreign birth less than one-tenth, or only 8.6 per cent., had been employed in the steel industry before coming to the United States. On the other hand, more than three-fifths, or 64.4 per cent., had been farmers or farm laborers in their native lands. At the present time the native Americans, English, Irish, Welsh and Germans in the iron and steel plants occupy the skilled and executive positions, while the recent immigrants from the south and east of Europe do the rough and unskilled labor. The industrial pregress and efficiency of the southern and eastern Europeans has been slow on account of their illiteracy and their inability to speak English. For this reason and the additional fact that the sons of Americans and older immigrants are entering the industry in constantly decreasing numbers, many employers express grave doubts as to the efficiency of the operating forces in the future. The loss in this respect, however, seems to be more than counterbalanced by improved mechanical devices and processes.

Earnings and Standard of Living

The average weekly earnings of all classes of iron and steel workers were $14.35. The average annual earnings of all employees, 18 years of age or over, were $346, and the average earnings each year of male heads of families were $409. The average annual income of families of all classes of employees was $548. Slightly more than four-fifths of all the families depended entirely upon the male head for support, while one-third, composed principally of southern and eastern Europeans, secured their income from such earnings and from the payments of boarders and lodgers. The families whose heads were native Americans depended more largely upon contributions of children than those the heads of which were born abroad.

As a matter of fact, the standard of living of the recent immigrant households was found to be very low. Most of the southern and eastern European steel workers were single or, if married, had left their wives abroad. Consequently they were able to adopt the group method of living, popularly known as the "boarding-boss" system, whereby each member paid a fixed sum, usually $3 per month, and the cost of food was shared equally.

Of the foreign born families, 41.5 per cent. supplemented the earnings of the heads by keeping boarders or lodgers, as contrasted with only 8.3 per cent. of the families the heads of which were native born. This practice has led to a high degree of congestion within the households the heads of which were foreign born, which can be seen from the fact that the average monthly rent per capita in households the heads of which were foreign born was only $1.14, while that in native American households was $1.71. The average number of persons per room in households the heads of which were of foreign birth was 1.76, as compared with 0.93 among the families the heads of which were of native birth; and the average number of persons per sleeping room in foreign born households was 2.89, as contrasted with 1.96 in the native born households. Of the total number of foreign born households 14.7 per cent. used all rooms for sleeping purposes, as against only 3.8 per cent. of the households the heads of which were native born.

Of the native born employees 20 years of age or over, 64.6 per cent. were married, and of the total foreign born 67.2 per cent. Of the foreign born employees 84.2 per cent. were able to read and 82.3 per cent. could both read and write. Of the employees of foreign birth who were of non-English speaking races only 51.8 per cent. were able to speak English.

The southern and eastern European iron and steel workers manifested very little evidence of general progress and assimilation. The tendency toward acquiring citizenship among the wage earners of foreign birth was very small, only 32 per cent. being naturalized and 11.4 per cent. having taken out first papers. Of the families the heads of which were foreign born 20.6 per cent. owned their own homes, as compared with 15.1 per cent. of those the heads of which were native born. Only 1.5 per cent. of foreign born and 3.6 per cent. of native born employees were members of labor organizations.

Eastern Blast Furnace Wage Reductions

In explanation of the 10 per cent. reduction in wages made last week at the blast furnaces of the Thomas Iron Company and the Empire Steel & Iron Company in the Lehigh Valley and the Wharton Steel Company in New Jersey, it is stated that this brings the basis back to that paid prior to October 1, 1909. It is added that wages paid by the above three companies are still higher than those paid by merchant furnaces in the Schuylkill and Lebanon valleys. The Thomas Iron Company is now reported to be operating at 53 per cent. of capacity, the Empire Steel & Iron Company at 50 per cent. and the Wharton Steel Company at 36 per cent. The rate of common labor and of all employees receiving less than $1.50 a day is not reduced. On behalf of the furnace companies it is stated that the price of pig iron has fallen fully $4 per ton since the beginning of 1910, and the cost of manufacturing to-day is fully $5 higher than in 1898, due to the gradual advance in wages since then, the higher cost for railroad freights, ores, fuel, supplies and all other material entering into the cost. The advance in material is also due largely to the advance in wages.

Trade Publications

Woodworking Machinery.—The Bentel & Margedant Company, Hamilton, Ohio. Catalogue L. This is the company's 1911 catalogue, describing and illustrating a complete line of woodworking machinery for various purposes. All the different tools are shown and brief specifications are given on facing pages.

Gas Exhauster.—Wilbraham-Green Blower Company, Pottstown, Pa. Bulletin No. 5. Illustrates the Wilbraham-Green rotary positive pressure gas exhauster, which can be driven by a belt, steam engine or electric motor. The illustrations show both the exterior and interior of the blower, and a brief specification table is also included.

Canning Machinery.—Ayars Machine Company, Salem, N. J. Catalogue No. 12. Size, 6 x 9 in.; pages, 64. Illustrates and describes a line of machinery for canneries, which includes not only the necessary apparatus for preparing the filling for the cans, but also shafting for driving the various machines and can making machinery and tools.

Air Compressors.—Clayton Air Compressor Works, 115 Broadway, New York City. Bulletin C-205. Treats of a line of vertical and horizontal air compressors that are particularly designed for automobile garage work for inflating tires, cleaning cushions and inaccessible parts of engines and for supplying air blast for brazing or soldering operations. The various types of compressors are illustrated and brief tables of dimensions are included.

Power Presses.—Joseph T. Ryerson & Son, Sixteenth and Rockwell streets, Chicago, Ill. Catalogue. Relates to a line of upright, inclinable, double crank and toggle power presses. The general features of the presses are first described and this is followed by a more detailed description of the various types. The text is supplemented by illustrations and brief tables of dimensions are included.

Upright Drill Presses.—The Aurora Tool Works Company, Aurora, Ind. Pamphlet. Devoted to a line of upright drill presses ranging from a 14-in. sliding head bench drill to a 44-in. back geared tool having a positive gear feed. The various drills are illustrated and brief specifications are given on facing pages.

Automobiles.—The Winton Motor Car Company, Cleveland, Ohio. Brochure. Devoted to the 1911 model of the Winton Six car. The various features of the model are illustrated and described and statements are given as to the maintenance required by previous models in actual use.

Power Transmission Appliances and Grates.—Valley Iron Works, Williamsport, Pa. Several pamphlets. Call attention to adjustable ball and socket hangers for shafting, a compression clutch coupling, friction clutch pulleys, pillow blocks, post hangers and floor stands, while others show four different types of grates. In all the pamphlets the various appliances are illustrated and brief dimension tables are included.

Traction Engines.—Hart-Parr Company, Charles City, Iowa. Catalogue No. 10. Gives general description and specifications for a line of traction engines using gasoline, kerosene and alcohol as fuel. The general features of the construction of these engines are first given, followed by brief descriptions of the three sizes of engine built—namely, 30, 45 and 80 hp. In addition to views of these engines there are a number of engravings showing them in use.

Steam Hammers and Hydraulic Machinery.—The Chambersburg Engineering Company, Chambersburg, Pa. Catalogue No. 33. Illustrates and describes a few of the hydraulic machines and steam hammers most recently built by this company. These include riveters, cranes, pressure pumps, presses and forging machines, all of which are operated by hydraulic pressure, and single and double frame steam forging hammers. Brief tables of dimensions are included for the various tools. In addition to the ones shown in the catalogue, the company is prepared to design and build other tools to suit any particular work its customers require.

Screw Machine Products.—Grant & Wood Mfg. Company, Detroit, Mich. Catalogue. Calls attention to a line of screw machine products of both standard and special types. The former includes set, cap and collar screws, coupling bolts, milled studs and hexagon and castle nuts. A number of the special parts are illustrated and several tables of useful information complete the catalogue.

Ignition Goods.—The American Coil Company, Foxboro, Mass. Catalogue. Calls attention to a line of ignition goods which includes induction coils, spark plugs, switches, timers, &c. All of these are illustrated and the engravings are supplemented by brief descriptions.

Drilling Machines.—The Rockford Drilling Machine Company, Rockford, Ill. Catalogue. Gives general description and specifications for a line of single spindle and gang drills, one page being devoted to each tool. An illustration of the drill is given on the upper part of the page, while a brief description occupies the remainder. Among the drills shown is the 14-in. drill with geared attachment for tapping six holes simultaneously, which was illustrated in *The Iron Age* February 3, 1910.

Drill and Tap Holder.—The Beaman & Smith Company, Providence, R. I. Pamphlet. Devoted to a safety drill and tap holder, the special advantages of which are simplicity, sturdiness and compactness. The holder proper consists of only four parts, the shank and body, the cap, the socket and the check or spanner nut. Five sizes in all of holder are made for handling drills and taps having a maximum diameter of from ¼ to 2½ in. The construction of the holder is shown and this is followed by a description of the various parts.

Motor Cars.—The Lozier Motor Company, Detroit, Mich. Pamphlet. Is a text-book on the construction of a modern high power automobile rather than a catalogue. The various special features entering into the four and six cylinder 1911 models are described and illustrated and space is given to the records made by this car in 1910.

Shapers.—The Smith & Mills Company, Cincinnati, Ohio. Catalogue. Illustrates and describes a line of crank and geared pillar shapers. Among the tools covered is the variable all geared drive shaper which was illustrated in *The Iron Age* May 5, 1910. Space is devoted to a number of attachments that can be supplied with the shapers and a complete telegraph code completes the catalogue.

Hoisting Engines.—The Chase Machine Company, Cleveland, Ohio. Pamphlet, consisting of loose leaf circulars. Lists the various types of reversing, hoisting, deck and docking engines which this company manufactures.

Machinery and Supplies.—Cutter & Wood Supply Company, 68 Pearl street, Boston, Mass. Catalogue No. 10. Size 6 x 9 in.; pages 667. Calls attention to a large and varied line of machinery and supplies which includes tools and supplies for machinists, engineers and foundries; factory, mill and manufacturers' supplies; transmission machinery and supplies, emery grinding and polishing machinery and polishers' and electroplaters' outfits and supplies. The various accessories are illustrated, and while the descriptions are of necessity brief they are planned to bring out the salient features. An extensive alphabetical index occupying 26 pages renders the finding of any desired article a comparatively simple matter.

Water Softeners.—The Kennicott Company, 50 Church street, New York City. Circular. Concerned with the Kennicott water softeners and their accessories, such as tanks, boilers and water weighers. All of these appliances are illustrated and briefly described.

Steam Boilers.—The Babcock & Wilcox Company, 85 Liberty street, New York City. Pamphlet. Contains a report of a test made on a Babcock & Wilcox boiler for the United States battleships Wyoming and Arkansas, which was presented before the American Society of Naval Engineers and is reprinted from the November number of the society's *Journal*.

Recording Liquid Weigher.—Henry R. Worthington, 115 Broadway, New York City. Pamphlet No. W-182. Gives general description and specifications for the Worthington recording liquid weigher, which is designed for measuring liquids by weight where there is little or no pressure and the liquid flows into the tank by gravity. Two sizes of weigher are illustrated and space is given to some special applications of the apparatus.

Spiral Riveted Pipe.—American Spiral Pipe Works, Chicago, Ill. Pamphlet, entitled "Water Powers of the Third Magnitude." Refers to the use of spiral riveted pipe in the water power line of the North Creek Electric Company and shows by numerous illustrations the conditions which had to be contended with in its construction.

Punching and Shearing Machinery.—Bertsch & Co., Cambridge City, Ind. Catalogue No. 3. Size 6 x 9 in.; pages 152. Illustrations and descriptive matter explain the operation of a line of tools for punching, shearing and bending sheet metal and iron and steel bars. These machines are adapted for belt, engine or motor drive, and included among them is the multiple punch and shear with automatic feeding mechanism which was illustrated in *The Iron Age* October 7, 1909.

Acetylene Lighting.—The Commercial Acetylene Company, 80 Broadway, New York City. Several loose leaf circulars. Deal with various appliances for lighting railroad cars, signals, locomotive headlights and houses by acetylene. The various fixtures and accessories used in each different line are described in the circular pertaining thereto.

Gear Tester.—The Adams Company, Dubuque, Iowa. Circular No. 821. Illustrates the Farwell gear tester for measuring the accuracy of the pitch circle and the tooth curves. An illustrated description of the tester appeared in *The Iron Age* September 29, 1910.

Ventilation.—Warren Webster & Co., Camden, N. J. Pamphlet entitled "Ventilation in Its Relation to Health." This is a reprint of a paper read by William G. Snow of Cornell University, which points out the necessity for properly ventilating rooms and public buildings.

Electric Fans and Water Motors.—Hunter Fan & Motor Company, Fulton, N. Y. Catalogue and pamphlet. The

former pertains to the Tuerk and H E fan motors, which are designed to meet all conditions, frequencies and voltages of alternating and direct current, and are applied to electric fans of all types. The latter describes and illustrates a line of ventilating fans for belt operation from a water motor and also shows the motor itself.

Power Transmission Chains.—Diamond Chain & Mfg. Company, Indianapolis, Ind. Catalogue B. Pertains to the Diamond chains for automobiles, bicycles and general power transmission. The various types of chains are illustrated, and this is followed by a list and description of the various parts.

Electrical Machinery and Appliances.—The General Electric Company, Schenectady, N. Y. Three bulletins. No. 4462-A describes the Thomson watt hour meters for switchboard service. No. 4790, superseding No. 4468-A, illustrates and describes in considerable detail two and three motor mine locomotives of various capacities arranged to operate either singly or in tandem. The company's gathering locomotive, which consists of any one of its standard locomotives equipped with a motor operated reel to which flexible cable is attached, is also described, as well as the various devices such as controllers, fuse blocks, head lights, &c., with which the locomotives are equipped. No. 4794 describes the 1200-volt lines of the Milwaukee Electric Railway & Light Company, and is a reprint of an article which appeared in the *Electric-Railway Journal* on the same subject.

Paper Making Machinery.—E. D. Jones Sons & Co., Pittsfield, Mass. Several loose leaf circulars. These show some of the various pieces of machinery built by this company, which include iron and wood tub beating engines, rotary fire pumps and motor and belt driven Jordan engines.

Power Presses and Roller Bearings.—Standard Machinery Company, 7 Beverly street, Providence, R. I. Catalogue and loose leaf circulars. The first is concerned with the roller bearings which this company manufactures under the Mossberg patents. The circulars cover a line of power presses which includes among others the 6-J power press illustrated in *The Iron Age* October 6, 1910.

Well Drilling and Prospecting Machinery.—Sparta Iron Works Company, Sparta, Wis. Catalogue. Size 7½ x 10½ in.; pages 60. Refers to a line of portable well drilling and prospecting machinery. The machines are illustrated and complete specifications are also given.

Pneumatic Tools.—Ingersoll-Rand Company, 11 Broadway, New York City. Form No. 9007. Concerned with a complete line of pneumatic tools, which includes rock drills, stone channeling machines, mining tools and pneumatic drills and hammers. Space is also given to air compressors, air hoists and motors and accessories used in connection therewith, such as hose and hose couplings, aftercoolers and air receivers and reheaters. The various tools and machines are all illustrated and are briefly described.

Traction Engines.—Fairbanks, Morse & Co., Wabash avenue and Eldredge place, Chicago, Ill. Catalogue No. 1426. Shows the company's 25-hp. engine, which is of its standard water-cooled four-cycle single cylinder type. It is said that when running at full load the engine consumes only from ⅛ to 1-10 gal. of fuel, which can be either gasoline, benzine, naphtha or distillate, per horsepower-hour. One of the special features of the engine is its easy starting, which is due to the use of a hand starter pump that forces a mixture of gasoline and air into the cylinder, where it is exploded with a match striker or an electric igniter.

Jewelers' Machinery.—The W. W. Oliver Mfg. Company, 1483 Niagara street, Buffalo, N. Y. Catalogue No. 17. Covers a complete line of jewelers' machinery, which includes rolling mills of the single, double and triple geared types; plating dynamos, bench shear and rod cutter, ring stretchers and benders, mandrels, bench lathes and bench drills and power drop presses. All of the various tools are illustrated and the engravings are supplemented by text.

Belted Vertical Milling Machines.—Becker Milling Machine Company, Hyde Park, Mass. Pamphlet No. 56. Size 6 x 9 in.; pages 24. Descriptive of the two smallest models of a new line of vertical spindle milling machines. The general construction of the line is described at length, and this is followed by a brief description of the special features of each of the two models.

Rotary Shear and Universal Bender.—Bethlehem Foundry & Machine Company, South Bethlehem, Pa. Two pamphlets. The first calls attention to the Bethlehem rotary shear, designed for shearing sheets and plates of metal, but also adaptable for cutting fiber board, sheet rubber, sole leather, &c. The two sizes of shear are illustrated and brief specifications are given. The other illustrates and describes a universal bending machine for structural shapes and pipe, which by using special rolls will bend the latter in spirals or coils. The special feature of this machine is that the shapes to be bent are passed forward and backward between the rolls, which are gradually raised at each pass.

Multiple Lathe Stops.—The Lodge & Shipley Machine Tool Company, Cincinnati, Ohio. Catalogue No. 22. Points out the advantages of using adjustable multiple stops for the cross and longitudinal feeds in lathe work for the rapid production of duplicate parts. The construction and use of both types of stops are described at length, and there are a number of engravings showing the different sizes of lathes to which this mechanism has been applied. Among the tools included is the 16-in. lathe, an illustrated description of which appeared in *The Iron Age*, November 18, 1909.

Automatic Gear Hobbing Machines.—Schuchardt & Schütte, West Street Building, New York City. Catalogue. Gives general descriptions and specifications for a line of automatic gear hobbing machines, which includes one that cuts noiseless gears; hob grinders, thread millers, tooth rounding machines, profile milling and grinding machines and cam milling machines. All of these machines are illustrated, and tables of dimensions are included. Among this number is an automatic thread milling machine, an illustrated description of which appeared in *The Iron Age*, December 1, 1910.

Machine Tools.—The Hamilton Machine Tool Company, Hamilton, Ohio. Loose leaf catalogue. Describes and illustrates a line of machine tools which includes lathes having swings ranging from 14 to 48 in., planers which are 24 to 60 in. wide between the housings, and upright drills, the swings of which range from 12 to 42 in. Each of the tools shown is described in considerable detail and brief specifications are included.

Lamp Sockets.—Harvey Hubbell, Inc., Bridgeport, Conn. Mailing card. Illustrates the new Hubbell double break pull socket No. 3618, which is said to be capable of carrying any lamp from the smallest up to the biggest Tungsten made. It has a current capacity which is claimed to exceed by at least 500 watts the demands of the largest lamp.

Ventilating Apparatus.—The Bentz System Company, 16 Lawrence street, Newark, N. J. Pamphlet. Describes the Bentz humidifier and air washer and gives photographs of several buildings where they have been installed.

Elevating, Conveying and Handling Machinery.—The Exeter Machine Works, Pittston, Pa. Bulletin No. 10. Contains a number of illustrations of machinery for elevating, conveying and handling coal and ashes. Space is also given to engravings of unloaders for handling bulky material, cranes, steam and electric hoists and cars for industrial railways.

Pneumatic Track Sanders.—American Locomotive Sander Company, Thirteenth and Hamilton streets, Philadelphia, Pa. Pamphlet. Describes with numerous illustrations the construction, installation and operation of the Leach sanders for locomotives.

Centrifugal Pumps.—The American Well Works, Aurora, Ill. Catalogue No. 117. Size 7¾ x 10¾ in.; pages 127. Shows a complete line of centrifugal pumps made in both the volute and the turbine styles. In addition to illustrating and describing these various pumps a number of test reports are included, and instructions as to the best way of installing and operating the pumps are given. A number of tables of useful information for pump users completes the catalogue.

Gas and Gasoline Engines.—The Backus Water Motor Company, 172 Pennsylvania avenue, Newark, N. J. Catalogue. Concerned with the Backus gas and gasoline engines for driving all kinds of machinery and a suction gas producer, which is built in sizes up to 250 hp. The Backus engines are built in 20 sizes, ranging from 1 to 75 hp., and with the exception of the smallest and the four largest can be furnished mounted on trucks or as traction engines. In addition to these horizontal engines vertical engines ranging from 100 to 250 hp. can be built to fill special orders.

Bolt and Tire Machines, Portable Forges, Drills and Shapers.—Boynton & Plummer Company, Inc., Worcester, Mass. Five pamphlets. The first refers to bolt cutting and heading and tire bending and shrinking machines. The second lists a number of different styles of portable forges, while the third and fourth give general description and specifications for an extensive line of drills and shapers. The fifth is devoted to detail parts for these machines and contains an illustrated list of repair parts and prices.

Furnaces.—C. U. Scott, Davenport, Iowa. Pamphlet. Covers a line of furnaces for annealing and hardening steel. The various types of furnaces and their accessories are illustrated and described and brief specifications are included.

Calendar.—The Grant Locomotive & Car Works, Houston, Texas, has sent out a calendar hanger measuring 21 x 23 inches. The calendar pad, which measures 3½ x 7¾ in., has white figures on a contrasting background, thus making them easily read at a distance.

Calendar.—The Flat Fuel Company, Bluefield, W. Va., shippers of Pocahontas coal and coke, has issued a calendar measuring 17 x 29 in. A specially noteworthy feature of the calendar is the size of the figures used to mark the dates. These are 1 in. high and are printed in white on a red background.

Gasoline Engines.—Brunner Foundry & Machinery Company, Peru, Ill. Pamphlet. Lists a line of horizontal gas and gasoline engines, air compressors, pumping jacks, pumps, wagon and platform scales, &c.

CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¾ in. round and square	₩ lb 1.75¢
1½ to 4 in. x ⅜ to 1 in.	₩ lb 1.85¢
1½ to 4 in. x ½ to 5-1	
Rods—⅜ and 11-16 round and square	₩ lb 1.85¢

Angles:	Cts ₩ lb
3 in. x ¼ in. and larger	2.00¢
3 in. x 3-16 in. and ⅛ in.	2.25¢
1½ to 2½ in. x ¼ in.	2.10¢
1½ to 2½ in. x 3-16 in. and thicker	2.00¢
1 to 1¾ in. x 3-16 in.	2.10¢
1 to 1¾ x ⅛ in.	2.20¢
⅞ x ¼ in.	2.30¢
¾ x ⅛ in.	2.40¢
⅝ x ¼ in.	2.45¢
½ x 3-32 in.	4.25¢

Tees:

1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.25¢
3 in. and larger	2.05¢
Beams	2.00¢
Channels, 3 in. and larger	2.00¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.00¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 16	₩ lb 2.55¢	2.80¢
Nos. 18 to 20	₩ lb 2.70¢	2.90¢
Nos. 22 and 24	₩ lb 2.75¢	3.00¢
No. 26	₩ lb 2.80¢	3.10¢
No. 28	₩ lb 2.95¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ lb 12 @14½¢

Patent Planished, W. Dewees Wood, ₩ lb A, 10¢; B, 9¢ net.

Galvanized.

Nos. 12 and 14	₩ lb 2.95¢
Nos. 22 to 24	₩ lb 3.30¢
No. 26	₩ lb 3.50¢
No. 28	₩ lb 3.80¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ lb 5.75¢
No. 26	₩ lb 6.25¢
No. 28	₩ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24 ₩ 100 sq. ft.	$3.85	4.80
No. 26 ₩ 100 sq. ft.	2.95	4.00
No. 28 ₩ 100 sq. ft.	2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:

IC, 14 x 20	$6.35
IX, 14 x 20	7.60

A. Charcoal:

IC, 14 x 20	$5.40
IX, 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20 107 lb	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.50
IX, 20 x 28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 13, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14¼¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14¼¢ ₩ lb

Brass Wire—

List August 1, 1908. 14¼¢ ₩ lb

Copper Wire—

Base Price. Carload lots mill 14¼¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 18¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished.

METALS—

Tin—

Straits Pig ₩ lb 42½@43¢

Copper—

Lake Ingot	₩ lb 14½@15¢
Electrolytic	₩ lb 14½@15¢
Casting	₩ lb 14¼@14½¢

Spelter—

Western ₩ lb 5¢ @5½¢

Zinc.

No. 9, base, casks ₩ lb 5¢ @5½¢ Open ₩ lb 5½¢

Lead.

American Pig	₩ lb 5¢ @5½¢
Bar	₩ lb 6@6½¢

Solder.

½ & ½, guaranteed	₩ lb 28½@29¢
No. 1	₩ lb 21½@22¢
Refined	₩ lb 19¢ @19½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb 8½@8¾¢
Hallett's	8¼@8½¢
Other Brands	6@7¢

Bismuth—

Per lb $2.00@$2.25

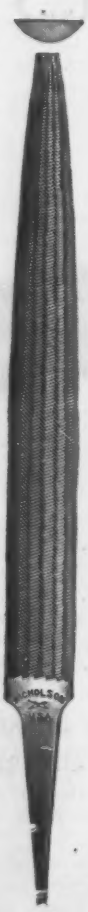
Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in lots for remelting	30¢
Rods & Wire	Base Price 32¢
Sheets	Base Price 32¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₩ lb 11.00@11.25
Copper, Heavy and Wire	₩ lb 10.75@11.00
Copper, Light and Bottoms	₩ lb 9.75@10.00
Brass, Heavy	₩ lb 7.25@7.50
Brass, Light	₩ lb 5.75@6.00
Heavy Mechine Composition	₩ lb 9.75@10.00
Clean Brass Turnings	₩ lb 7.25@7.50
Composition Turnings	₩ lb 6.25@6.50
Lead, Heavy	₩ lb ....@3.75
Lead, Tea	₩ lb ....@3.50
Zinc Scrap	₩ lb ....@4.00



NICHOLSON

Granted that just ONE mechanic in your shop can save from ten to twenty minutes time per day through the use of NICHOLSON FILES—how great will be the saving when from fifty to one hundred or more men "get busy" with the fast cutting

NICHOLSON?

NICHOLSON U.S.A. TRADE MARK

Nicholson File Company

Providence, R. I.